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Hints on Grape Culture.—XVIII.

IT may as well be stated here that we purpose taking up and following out one system of training at a time. The attempt to describe several modes at the same time must inevitably produce confusion. This course may make some repetition necessary, but that is a small matter compared with clearness. It is better that the reader should have a clear apprehension of one system than confused ideas of many. The subject is not likely to prove irksome.

We left the vines at the end of the second year ready to be pruned. We will suppose it is late autumn, the wood being ripe and ready for the knife. The first vine in a row has a single cane; the second has two canes; the third has one cane, and so on alternately, every other vine having two canes. It will not matter much, however, if some of those indicated as having only one cane should have two. We will suppose, however, that the vines are in the condition first named, every other one having a single cane. Our object now is to begin the formation of the arms. These, as already stated, might in some cases be formed at once of their full length; but we think it is very much better not to do so. The arms, when formed at once, are never as strong as they are when formed by degrees; and not only are the arms not as strong, but the buds also partake of the same weakness. The latter circumstance forms a very serious objection to the immediate formation of the arms. It is, indeed, a matter of the very first importance to have the buds strongly developed from the beginning, and this can not well be done if the arms are at once formed of their full length. It is even more important that the buds near the trunk should be as strongly developed as those near the ends of the arms, and this is impossible where the arms are left their full length at the beginning. The flow of sap tends to the ends of the shoots, and the buds at the ends, consequently, are the strongest when left to themselves. This

tendency of the sap is natural, and can only be overcome by artificial means. The whole vine, when under cultivation, is to a considerable extent placed under restraint, and the flow of the sap must be made to yield to the same condition, when the largest and best results are sought to be obtained. It is a matter of every day observation that the vine, in a state of nature, is entirely destitute of fruit wood near the base, and for a considerable distance above it, the fruit being borne principally near the ends. The same state of things is found in vines badly trained, especially on arbors, a bunch of grapes being scarcely ever found within three or four feet of the ground. One of the principal objects of training is to control this tendency to bear at the ends of the shoots, and to place the fruit wood in such positions that each square foot of the trellis shall yield its due proportion of fruit. This, happily, can be done with comparative ease if some good system of training is adopted when the vine is young. We dwell somewhat on this point because there is a prevalent opinion that training can be adopted at any time. Many, indeed, seem to think that it is a matter of no moment how their vines grow during the first two or three years; no greater mistake could be made. Unless a right direction is given to the arms and buds when the vine is young, no after treatment, however skillfully applied, can properly develop them. The only recourse, in such cases, is to cut the vine entirely down, and begin anew.

Now let us see what is to be done in order to develop the buds near the trunk. We have two canes to be pruned for the formation of arms; if the vines are four feet apart, the arms will be four feet long. If we leave them of this length, the buds near the trunk will be weak, not only now, but always hereafter. Instead, therefore, of leaving them four feet long, cut them two feet. The sap, in this case, having a shorter course to run, will distribute itself more equally among the fewer buds left, and give them a fuller development; in other words, its power, confined within narrower limits, becomes intensified, and the points of application receive an increased impetus. But, to develop the base buds equally with the end buds, something more than shortening in the arm is necessary, as will be presently explained. The pruning, therefore, will consist in cutting the arms to half their proposed length, whether it be four or six feet. All laterals and superfluous shoots must be entirely cut away, leaving nothing but the piece of cane intended for the arm. The cutting should be close, and neatly done, in order that the wound may heal over nicely.

We have stated that the arms on every other vine will be formed three feet above the first wire. These arms can not, of course, be formed this season, and every other vine, therefore, must be pruned to a single cane three feet long. If, however, the canes should not be strong enough to leave this length, they must be cut shorter. So, too, if any of the other vines are not strong enough to leave two feet of the cane for arms, they also must be cut shorter. The canes in all cases must be cut back to strong wood. One foot of strong wood is better than

two feet of weak wood. In pruning the vine, therefore, the undeviating practice must consist in cutting back to good, well-ripened wood. We have mentioned two feet above, because nearly every vine, if well grown, should have much more than this; but there will always, even under favorable circumstances, be a few weak subjects, and these must be strengthened by a free application of the knife.

The vines having been pruned, it may be advisable, in some cases, to cover them. At the first year's pruning this was done by simply drawing some earth around them in the form of a hillock; but the canes are now too long to be treated in this way. It will therefore be necessary to bend them down and throw a few inches of earth over them, only just enough to hold them down, for too much covering is apt to prove hurtful. The vines must be bent gradually and carefully, and pegged down if necessary. As the vines grow older they will bend easier, an old vine having more elasticity than a young one.

Having placed the vines in winter-quarters, we will leave them there quietly for the present.

REJUVENATING OLD HOUSES.—NO. II.

BY MYRON B. BENTON.

THERE are undoubtedly many houses of the kind referred to in the previous article, which it is better to tear down than to attempt repairing. But this is not often the case with one which has been kept in good repair, even if it be a century old. If your house is tolerably good as a protection from the weather, but which for other reasons it is desirable to repair, listen not a word to the earnest solicitations of your carpenter about its being cheaper to build entirely new than to attempt any thing with such an old structure. If it is pleasanter for him to work up fresh materials, it will not be for yourself to pay for them when all the bills are brought in. I know one old house—a part of it built more than a hundred years ago—which has been recently repaired, and very satisfactorily too, at a cost of about $1,200, giving accommodations which would have cost in a new house not less than $3,500 to $4,000.

Perhaps the mere item of tearing down a house is not sufficiently appreciated by one who has never tried it. One who has, I heard remark that it is nearly as cheap to set fire to the building as to attempt saving the materials by taking it apart.

As any general plan of arrangement has been necessarily out of the question in these old farm-houses, where a thorough repair is undertaken, much more skill is required than for an entirely new one. The kitchen-wing having suffered most, the best planning of the architect will be required there. It will do to skirmish with slight attacks around the front ranks, but a few bold strokes must be made

in the rear, or the battle will be lost. The kitchen, especially if it be also the dining-room, must have one side with a light, cheerful outlook. Generally a few cumbrous lean-tos must be sacrificed, that two or three large windows may be made, not under a deep, low veranda, but receiving the perpendicular light. After that is accomplished, considerable skill must be exercised in grouping those apartments which properly belong together.

In order to avoid too many rooms opening directly from the principal one, a passage may sometimes be constructed to connect with several. It is wonderful what a change for the better may be accomplished by a little adroit management and a few bold destructive attacks on the kitchen-wing.

It is impossible to particularize with regard to the various parts in a class of houses varying so widely in their places. The living-room ought, of course, to occupy the pleasantest position. Its bay-window (which, if there be any, should be here instead of in the parlor) should command a view of the best features of the surrounding landscape. It is well, too, that the highway be in plain view from this room. There is an affected taste prevalent in this matter. It is thought vulgar to care about what is going on in the street. For myself, I will acknowledge that I like occasionally to see the physiognomies of friends or strangers who are passing. There is much of sociality even in a glance or a nod of the head, though no word be exchanged.

In repairing, above all avoid pretension in the style; it is disgusting in a new house, but intolerable in an old one. Do not assume that it is a new house, but leave, if possible, some impression in its features of venerable age. Let the house show that it is an old one, and is not ashamed of it, though in a new dress. A grandmother is always more presentable if in a clean cap neatly plaited, but her gray locks are far more beautiful than if they were dyed jet. Leave the roof with a pitch of forty-five degrees, and watch the boss-carpenter closely when he comes to the cornice. It may be sometimes necessary (so untractable is this class of men) to deface in the night what has been wrought in the daytime. But a few blows with a hammer will easily demolish the flimsy ornaments to which I refer.

The color for the exterior should be carefully selected. A reäction in the public taste from glaring white has resulted in hues no less objectionable. Any thing gloomy should be avoided.

Every thing about the exterior of a house should combine to give a look of *repose*. How few do we see that attain this! how many wear an *uneasy* look! as if they were not contented in their position. The latter expression is often produced by the roof being too much broken with dormers and gables.

I have a few words to offer with regard to the grounds immediately surrounding some of these old farm-houses, which, with your consent, Mr. Editor, may be given in another article.

[We shall be very glad to have the promised article on the treatment of the

grounds. It is a good field for criticism, and we hope you may be as successful with it as you have been with the old farm houses. There is one point, however, in regard to old farm houses which has been overlooked. These are in many instances so badly located, that one often feels inclined, though reluctantly, to pull them down for this reason alone. Where the house is properly located, we should hesitate long before destroying it, but we should hardly attempt to "rejuvenate" it, unless the house and its surroundings were pleasantly situated, or could be made so. This can sometimes be done, and a very considerable outlay thus spared to the owner.—ED.]

THE EARTH-WORM—ITS USE.

(From the Scottish Farmer.)

REAUMER calculated that the number of worms in the earth exceeds the grains of all kinds of corn used by man, and as, perhaps, there is no other animal so preyed upon without any diminution in number as the earth-worm, the calculation may be not far wrong. Hedgehogs, frogs, and moles devour it; beetles prey upon it, and often cast their young upon it; and but for the earth-worm a large portion of the bird family would soon deteriorate or perish, for, with the exception of the finches, there is scarcely a bird, from the robin to the wild goose, but eats it, and many, during open weather, live almost solely upon it. After a summer shower, the farm-yard ducks actually race against each other along the road side in search of it; and on wet days they each devour hundreds. All river fish feed to a great extent upon it; and wherever the river beds are of a clayey substance, worms are more plentiful than in *terra firma*. The river worms are darker in color and flatter as a whole than the earth-worms, but so little do they differ in appearance that a novice could not tell the land from the water-worms. The worms in the water live under the imbedded stones, and trout are generally on the watch to gobble them whenever they leave their abode; they even move and turn over the stones in search of the worms and larvæ of water flies. When a flood comes the stones are generally displaced in great numbers, and at such a time (in a river such as the Tweed, for instance) the worms must be dislodged and carried along the river bottom in tens of thousands; and it is from this cause that the trout are generally gorged with worms and larvæ when taken after a flood. It is for such food, too, that ducks are constantly *gumping* among river shallows; for, if watched, it will be seen that they insert their bills below, or move, mostly all the likely stones they pass. We have frequently turned up worms at a depth of about a foot in the river.

But though the worm yields a considerable amount of food to the birds and fishes that grace the dinner table, it is much more beneficial to man as a fertilizer of the land. Subsisting on the earth through which it burrows, with an occasional meal from a decaying tuber or leaf, its peculations from the husbandman are

of the smallest nature; whereas it lightens "the earth's surface" by its burrowings, and thereby aids the spreading of the roots of all cereals and bulbs; and the burrows also carry down water after heavy rains, that, but for them, would often gather in surface pools, and thereby injure the crops; they also admit the air to the soil to a depth which by natural means it could not reach. The earth ejected by them also tends to the improving of the soil; and instances are known whereby these droppings or "worm-casts" caused in a few years a considerable increase in the depth as well as in the quality of the soil. Mr. Darwin, the naturalist, gives an account of a case of this kind which he tested, and from experiments, he clearly proved, that in an old pasture, a layer of cinders and lime had been covered in a few years to the depth of an inch, by the castings of worms. "On carefully examining," he also wrote, "between the blades of grass in the field above described, I found scarcely a space of two inches square without a little heap of cylindrical castings of worms." Now, a week or two ago we chanced to walk through a very old pasture, and we were much struck by the number of worm-casts it showed. They were, we are certain, nearly, if not as numerous as those mentioned by Mr. Darwin, and they darkened the field so much, though the grass was growing, that they caused some parts of it to look as if newly top-dressed. And when the fine soil thus raised gets spread by the feet of sheep or cattle, we doubt not but a stimulating top-dressing it will make. We have since examined several old pastures, and the castings were numerous in each; but we noticed that they were fewest in the pastures where lime had been most used. This we set down to the hurtful effect that lime will be likely to have upon the wormlings.

The earth-worm is in more cases injurious to the gardener than the farmer. The giant lob-worm occasionally carries the main leaf of a young plant boldly into its hole; and in gardens the barrenness of the soil enables the observer to notice that it is a common thing for a worm to drag straw, grass blades, plants, leaves, etc., into its hole; but for what purpos e these are carried down nothing definite is known. The things taken down, however, pass into manure. The worm in the garden has its uses if it has its faults; and when it partakes of "green meat," which it never does extensively, the food selected is generally some vegetables or root rendered soft by decay.

They do not penetrate the soil to any great depth, because they require air. In stiff soils they are not generally found much beyond a foot from the surface, but on lighter soils, through which they bore with much more ease, they may be found deeper. At all events, they go deep enough to permeate the soil, and air and drain it, at a depth to which the plow can not reach, and for which, we fear, they get but little credit. Indeed, their usefulness is seldom thought of, whereas by the many they are still ignorantly looked upon and loathed as the "wriggling tenants of the grave."—

[The above from the *Scottish Farmer* is a good vindication of the much-abused earth-worm. Except when they get in pots, we do not think them injurious to the gardener; on the contrary, we esteem them one of his best friends.—Ed.]

STRAWBERRIES AND PEACHES IN SOUTH ILLINOIS.

BY A. BABCOCK, SOUTH ILL.

EDITOR OF THE HORTICULTURIST,—The varieties of Strawberries fruited here this season are as follows:

Wilson's Albany is grown more extensively here than any other, and fully sustains its reputation for great productiveness, good size and firmness of berry, making it *the* sort for shipping north. Greatest yield here this season was 50 bushels from a quarter acre. With best culture a larger crop would undoubtedly be had.

Triomphe de Gand has been fruited by several here this season; fine large fruit, healthy, good grower; hardy enough, but not as productive as Wilson by about 40 per cent.

Downer's Prolific. Quite productive, fair size; berry rather soft to bear transportation well; a very little earlier than Wilson; is not suitable for hill culture, as it does not bear any better than when allowed to cover the ground; sends up runners in great profusion.

Hooker does not bear as much as Wilson by one-third with same culture and soil; does not average quite as large, but much superior in quality.

Jenny Lind. Only two or three days earlier than Wilson; a pretty fair bearer, but many of the berries *small*, rather soft, flavor rather insipid to *my* taste; not suitable for hill culture. My first choice for market is Wilson; second choice Downer's Prolific; first choice for family use Hooker; second choice T. de Gand.

I do not think the "Bartlett," which Mr. Fuller speaks so highly of, has been tried here.

The Strawberry crop of Egypt this season was shipped mostly to Chicago in round quart boxes, and sold at from 15 to 50 cents per quart; average price about 20 cents. Freight from here to Chicago, by express, $1 per 100 lbs.

Our Peach trees are well loaded with fruit in all situations, high and low. Budded trees are bearing as well as seedlings, although but few of our orchards of budded trees have been set more than two or three years. Our most popular early market peach yet tested is Troth's Early Red. This variety ripened here last year a few days earlier than Serrate Early York, and sold readily in the northern cities at $2 50 per box, (half bushel.)

Serrate Early York bears well, and has been planted largely. Crawford's Early does not sustain its eastern reputation here as a great bearer, although it does pretty well. But few trees of Early Tillotson in bearing here yet, but those who have fruited it think it higher in quality than either of those named above, but not quite as early as Troth's Early.

Galbraith's Seedling, originated by Mr. Galbraith, of Mount Vernon, Ill., is

thus described to me by those who have seen the fruit: a little larger than Troth, and fully equal to it in quality; time of ripening about the same; not quite so good a bearer. It has not yet been fruited in this country, but is being propagated and planted considerably a little north of this. "Hale's Early," of Northern Ohio, has not been fruited here, but as it is highly recommended by such men as Dr. Warder, M. B. Bateham, and others, we shall propagate from it quite largely for future planting. It is *said* to be very early, of excellent quality and good size. Our later varieties are very numerous. Those most planted are Large Early York, Oldmixon Free, Stump the World, Crawford's Late, Heath Cling, Ward's Late Free, etc. We have several superior Egyptian seedlings, some of them being equal in size and flavor to such as Crawford's Late, but none of them are very early.

[This is another good report from "Egypt." We should be glad to have more such from there and elsewhere. The Hooker is undoubtedly the best flavored berry of all those you name. When grown in a soil that suits it, it bears a good crop, and is then the best of Strawberries for family use; but in some places the product is small. We should be sorry to be without it. At the East, the Triomphe is usually more profitable than the Wilson as a market berry, besides being much better fruit. We should like to see some of your Egyptian seedling Peaches.—Ed.]

ON FUNGI, THEIR RELATION TO DISEASE.

BY JOHN LOWE, M. D., M.R.C.S., ENGLAND,

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It is now more than twenty years since it was first discovered that vegetable growths could exist upon the human body. From the earliest age diseases of the skin were known and described: the symptoms and appearances they presented were matters of ordinary observation, and rules of an empirical character were laid down for their treatment.

During all this time, it is probable, nay, almost certain, that in some forms of the disease fungi were constantly present, but it was not until the year 1839 that this fact was demonstrated. To M. Schœnlein, of Berlin, we are indebted for this most important discovery, which, but for the rapid advance that has been made in scientific knowledge during the present century, and above all in the proper use of the microscope, would, like many other wondrous things, be still one of nature's own secrets. Even now, strange to say, there are those who regard the growth described by Schœnlein as an abnormal production of the body, and

deny its vegetable origin; but a vast amount of accumulated evidence leaves no room for doubt upon this point, to any one who is at all conversant with the character, structure, and behavior of the humblest individuals of the plant world, the Fungi.

Regarding it, then, as an established fact, with botanists and the medical profession generally, that a fungous growth is really present in the majority of skin diseases, I shall abstain from entering on the discussion of the reason for upholding this opinion, and leave the facts, to be presently mentioned, to speak for themselves; suffice it to say here, that men of the greatest eminence as botanists and physiologists entertain no doubt on the subject.

We have, however, another and a larger class of observers, who, while they admit the presence of the fungus, disclaim for it any title to be considered as an originator of disease, but regard it rather as a foreign and accidental visitor, engendered and fostered by the products of a pre-existing malady. Upon this more important dogma, which has, in this country, been the subject of much argument, I propose to speak at greater length, inasmuch as it is a question of considerable interest, in a medical and hygienic point of view.

Before doing so, however, let me point out some of the various forms of fungi which have been noted, as occurring upon animal organisms, in order that I may put before you the salient points which are worthy of interest and attention. The whole of these lower fungi are ascribed by botanists to a subdivision of the family, which has received the name of *Hypomycetous*. They are minute microscopic plants, consisting, in their perfect state, of a mycelium, that is, a net-work of fine capillary tubes or filaments, from which springs an upright, hair-like stalk bearing at its extremity a collection of spores or sporules—the seeds of the plant. These have a diameter of about $\frac{1}{3000}$ of an inch, and from their extreme lightness are capable of floating about in the atmosphere, and are wafted by the air to every quarter in incalculable myriads.

Whenever they alight upon objects favorable to their growth, as upon decomposing organic matter of any description, they readily germinate, provided there be sufficiency of warmth and moisture, both of which are essential to their well-doing.

Let us follow one of these spores, thus located, and watch its development; we shall then have the key to the behavior of the rest. When first given off from the fruit-stalk it is a spherical cell, consisting of a cell-wall filled with homogeneous molecular plasma, but without a nucleus; on the application of warmth and moisture the cell assumes, in the first instance, an oval form; the cell-contents become granular, the granules ultimately coalescing to form one or more nuclei. In its next stage, it becomes elongated, until its length exceeds its breadth by two or three times, and now we observe small eminences arise from its extremities; these are buds, which, in their turn, become elongated cells, and then give off other buds or shoots, each in succession acquiring additional length, until, finally, we find them as

filaments or thread-like cells, crossing each other in all directions, and forming a network which is termed the mycelium.

At a more advanced stage, these filaments are seen to contain mumerous nuclei and granules, and now, several slender threads are pushed perpendicularly upwards; these are fruit-stalks, the terminal cell of which undergoes budding or segmentation, until a large number of spores is formed into a capitulum or head. These, like the original cells we started with, are spherical, and their arrangement varies in different genera; for example, being collected into a round head or glomerulus, as in *Mucor;* or into a brush-like one, as in *Aspergillus*, so named from a fancied resemblance to the brush used for sprinkling holy water in Roman Catholic Churches.

Such is, briefly, the mode of development of these minute plants under favorable conditions. But there are occasional deviations to be met with, which are deserving of attention, as throwing a clearer light upon certain forms which are to be mentioned presently. This will be manifest when I state that, from the results of numerous experiments I have made, the plant may be caused to remain in any one of its different stages of growth by supplying it with food suitable for that purpose. The bearing of this statement will be seen in the subsequent remarks upon the identity of the parasitic fungi. A familiar illustration of the power above mentioned is to be observed in common yeast, which presents itself as a collection of spherical cells containing nuclei, and capable of endless multiplication in two ways, viz: by the formation of buds, or by the bursting of the cells and the liberation of nuclei, which become cells. Yeast is derived from the aerial spores of one or more common species of mould. This I have proved by experiment; and I have recently obtained additional proof of the correctness of this view from the examination of spontaneous yeast of the tan-pits kindly forwarded to me from Kingston, Canada, by Professor Lawson. This in no way differs from brewer's yeast which has been long kept. The favorite fruit of the yeast-cell is sugar, upon which it acts in such a manner as to disturb the feeble combination of its chemical elements. This process, which is termed *catalysis* by chemists, causes decomposition of the sugar and a new arrangement of its particles, giving rise to carbonic acid and alcohol. Sugar is essential to the maintenance of yeast in its integrity. As soon as its requirements in this respect fail to be supplied, the plant turns for its prey upon the new element it has evoked, the alcohol, which is at once converted, by a similar process, into vinegar. Here the cell becomes changed in form. It is now oval, and this condition, which has received the name of *Torula*, it may be made to retain indefinitely; but under ordinary circumstances, it proceeds to convert the acid into other compounds, and its development goes on rapidly until it has assumed the form of a filamentous mycelium. In this stage, again, it can be retained at will, as the vinegar plant, or, as it is popularly termed, the "*mother*" of vinegar, which possesses the power of at once converting saccharine matter into acid, apparently without the intermediate alcoholic fermentation. If now exposed to the air,

it completes its growth by producing spores, which in their turn go through the same cycle.

With this slight sketch of the natural history of one of these minute beings, we will now notice some of the more important effects which they are reputed to produce. And, first, let us glance at their influence on the higher forms of vegetables.

It appears certain that before any great damage can be done by these parasites, there must pre-exist in the objects of their attack an unhealthy condition of structure, resulting partly from being deprived of some chemical element essential to healthy growth, and partly to atmospheric changes which tend to foster a too rapid formation of cellular tissue, at the same time that they favor the rapid development of the parasite. The result of these changes in the plant is a lowered vitality, rendering it prone to the attacks of the fungus, which, once having found a habitat, spreads with prodigious rapidity, and by setting in motion chemical changes similar to those already spoken of, soon involves the whole plant in decay. Examples of this will be familiar to you, as in the case of the potato disease, which not many years ago brought England to the verge of famine, and in Ireland, which depends almost solely on this crop, was the cause of untold misery and destitution.

The failure of the vine crops in Spain and Portugal was owing to the ravages of another species, *Oidium Tuckeri;* and in some seasons the wheat crops in this country are to a great extent damaged or destroyed by another of these minute pests, which, under the name of mildew, often in the course of a single night, converts whole fields of waving corn into black, useless rubbish. Dry-rot in timber is another example of the destructive power of this group. Nor are these the only commercial interests which thus suffer. The production of silk is often a complete failure, owing to the silk-worm being infested by a minute fungus, the *Botrytis Bassiana*, which, entering, probably by the spiracles or breathing apertures, insinuates itself into the blood-vessels and destroys the insect. Damp and want of cleanliness are found to be the cause of the attack. Other species again have been found in flies, beetles, eggs, in the air sacs of birds, on fish, reptiles, and animals, the mention of which would encroach too much upon your time. A great part of those which have received distinct names, as well as nearly the whole of those from the human subject, I have proved to be mere initial or imperfect forms of one or two common species of mould which occur every where upon decaying organic matter, as cheese, apples, oranges, etc. The number of plants thus degraded from the rank of species is about thirty-four, and I doubt not that many others might be placed in the same category.

The first discovery of a vegetable parasite on man was, as I have said, made by M. Schœnlein, of Berlin, while examining the crusts from the head of a person affected with favus, (Porrigo lupinosa, or scald head.) The plant has been since known under the name of *Oidium Schœnleinii*. Another parasite was subsequently

discovered in the hairs of persons affected with the disease termed *plica polonica;* also a similar one in ulcer was found by Mr. Robin.

Others have been found in Tinea, Porrigo, Pityriasis, Lichen, and Sycosis, etc., etc. Others again in the lungs and on the mucous surfaces of the body. Now the whole of these are referable to a common origin; the characters which have caused them to be raised to the rank of species being due to the plant having been *retained* in a state of immaturity. So singular is this power of being so retained, that we might almost reduce it to a formula. Giving a certain quantity of sustenance, we might predicate the form which the parasite would exhibit, and thus we find no difficulty in accounting for the great variety which is met with on the human subject alone; difference in density and chemical constitution of textures, in degrees of warmth and moisture, in greater or less facility of access to external air, will readily account for these differences in form, and will render it no matter for surprise that microscopists should have given distinct specific names to upwards of thirty plants which are in truth referable to one or two.

There remains one very peculiar variety to be mentioned. This consists of minute, square-shaped cells arranged in fours. It was discovered by Professor Goodsir, in a disease of the stomach, and was named by him *Sarcina ventriculi.* A similar one has been observed by Dr. Gardner and others, from the kidney. There is now good reason to believe that both these are merely varieties of the common fungi of which we have been speaking, Penicillium and Aspergillus, for identical growths have been found by Mr. Stephens on bones from South America; by Dr. Fox on the human subject, in a case of skin disease; and by myself in a vial containing crystals of cholesterine.

Let us now inquire into the power which fungi have of generating disease. Their influence upon plants has never been doubted: First, because their ravages are too well known, too serious, to admit of dispute; and, secondly, because their malific agency upon structures of a low organization, allows of more easy demonstration, than when highly organized and sensitive tissues are the seat of their operations, and when more various forces and conditions are to be considered.

It is no difficult matter to show that dry-rot, as it is termed, would be a comparatively slow process, were it not that the fungus is present, to insinuate itself among the fibres of the wood, to give admission to air, and to yield oxygen, which hastens the already commenced decomposition; while at the same time the living cells abstract chemical elements from the woody fibre, and fan into activity the eremacausis or slow combustion of the decaying tissue. Equally obvious is the fact, that without yeast, wort would undergo but little fermentation, and that if all vegetable organisms were excluded, no proper fermentation would result; for even in the case of wine, which is conducted without the artificial aid of yeast, I have found that it is really the source of the fermentation.

We may assume, then, as a fact, which few will deny, that a living vegetable parasite upon other vegetable cells, must excite in them a chemical action, equivalent

to fermentation, for it can not grow without so doing; and that even supposing the cells themselves were able to resist this action, the juices of the plant, not possessed of the same vital resistance, must succumb to its influence. Whether this alone be the real secret of its power, affects not the question. If the juices are decomposed the cells must suffer, and the morbific agency is at once apparent. But there is another point in which their action is not unimportant, viz, the power which fungi have of inserting themselves among the cells and tissues. Physiologists, and especially medical writers, overlook this fact, that a cell confined in a limited space, and at the same time undergoing development, must expand in some direction, and the force thus generated is almost incredible. Many of you have no doubt seen a strong wall pushed down by the growth of a tree; that this, by the expansion of soft and otherwise yielding cells. But perhaps a more impressive fact is, that simple cellular fungi, growing under large stones, have raised them from their beds to the height of some inches, even when the stones were several hundred pounds in weight; and yet so soft is the structure of the plant that it might be crushed between the finger and thumb. Here is a power not to be ignored when discussing the influence of parasites. Let us see how it applies to the production of disease in animal tissues. Each individual cell, it must be borne in mind, possesses the same motor power; it is only their combined action which yields great results such as the above. Suppose, then, a single tube inserted into the skin and impinging upon a nerve filament, would you not expect that nerve to resent the intrusion? Would it not do so if any other foreign body of the same size were introduced? How much more then, if, in addition to mere mechanical irritation, the cell proceeds to abstract or decompose the fluids. That it does this, which is indeed the essential function as a scavenger, we see in favus and ring-worm, where, especially in the former, the odor produced by it is intolerably fetid and irritating. It is clear that what with the actual pressure of the outspreading fungus, and the irritating products which it engenders, there are strong *prima facie* grounds for believing that the fungus does actually produce disease.

Then, again, if proof were wanting, observe the peculiar character of *lichen annulatus*, fairy-rings in miniature, presenting all the characters that fairy-rings do, and showing clearly enough that the fungus and rings of inflammation proceed *pari passu*.

The form of the disease will be determined by several minor conditions affecting the growth of the parasite; these we have before mentioned as warmth and moisture, suitability of food and density of tissue, all of which influence the development of the plant; thus we find in *Lichen*, one form; in *Pityriasis*, another; in *Favus*, a third, and so on; the spread of the disease being co-equal with that of the plant, and the degree of passive resistance which the tissues offer to its inroads.

It must be admitted here, as in the case of plants, that an unhealthy condition of the structures and fluids is necessary to the development of a parasite, for with-

out these it would be incapable of establishing itself. The first attack would in a healthy body be at once resented, and the intruder repelled.

I would remark before concluding, that those diseases which are probably considered as of a parasitic origin, have recently been shown by clinical observation to be identical, and capable of merging one into another by imperceptible gradations; thus establishing the fact which I had asserted from experimental inquiry and the development of the parasites.

In conclusion, a word or two as to the treatment of this class of diseases may not be out of place.

The primary consideration will at once suggest itself, that since the fungi can only attack an enfeebled system, it is essential for the cure of the disease that the general health be restored by treatment appropriate for that purpose; for we can not expect a successful result while this important cause is still in operation.

The remedies which have attained celebrity as specifics, have little claim to be considered, since, if we except arsenic, which, by-the-way, is only useful when it is pushed to a dangerous extreme, they are all of but little value.

Of the topical applications I may observe, that my own experience of them is, that they are either inefficient or dirty, or both. The one to which I trust almost solely, has this to recommend it, that it is neither.

Its action is founded on what ought to be our guiding principle in the treatment of these cases, viz., the destruction of the parasite; and this, from extended observation, I believe to be effected by the Tincture of Iodine, far better than by any mineral or other agent we can employ; at the same time its application is unattended by any inconvenience.

It is simply an alcoholic solution of Iodine, thus: Take of Iodine, 1 drachm; Iodide of Potassium, half a drachm; Alcohol, one ounce; solve. Paint the diseased part every day or on alternate days; omitting it for a day or two if the skin becomes sore, then resume it, and continue the application until the disease has disappeared.

As yet I have met with no case which has resisted steady treatment of this kind, neither do I believe that I am likely to do so.

[The above is a subject little understood, but of profound interest, and is ably treated, though we can not say that we agree with all the author's conclusions. The paper was read before the Botanical Society of Canada, from whose proceedings we copy it.—Ed.]

CULTURE OF THE APPLE IN POTS.

(Translated from the German of Diel.)

I MUST naturally suppose that persons ignorant of the art of fruit culture may wish to raise fruit trees in pots, and for such many an explanation is necessary, which those skilled in the art will excuse. The operations of grafting, though, I will omit, as they may be found described in any book treating of fruit culture. The peculiar requirements of raising fruit trees in pots is our only aim. Each kind of fruit of the two botanical classes *Pyrus* and *Prunus*, (*kernel* and *stone fruit*,) or the three * pomological classes, after the system of nature, as apples, pears, and stone fruit, requires for its pure propagation through grafting, certain so-called stocks, peculiar to it, if it is to thrive well, and bear fruit of its own natural quality. Pomologists of the oldest times undertook, indeed, many experiments to elevate nature over itself, or, rather, to disturb its course and produce monsters. These experiments exhibit the childishness of their pomology, which, with the true knowledge of nature, lay yet in its cradle. They would produce stone fruit without stones, fruit impregnated with foreign species! They grafted peaches on willows to have them of the melon size. No extraneous grafting has, as is just, remained to us, but pear on quince; the hawthorn, (Crataegus oxyacantha) has long ago been dismissed. For apples, then, nature gives us two kinds of stocks, namely, the wild apple tree, (Malus sylvestris,) and the wild apple shrub, (Malus pumila.) For culture in pots, only the latter can be used, if we expect yearly fruitfulness and durability of our trees. This wild apple shrub has, from the time of maturing its fruit, received the name of "Pomme de St. Jean," (John Apple,) in France. Paradise apple (Pomme de Paradis) piety may have named it because it has four seed chambers. This shrub will scarcely ever grow over three inches thick, and eight to ten feet high, and bears small, insipid apples. It is of very slow growth as a tree, like all the shrubs, but, like these, it also throws up suckers from two to four feet high in one year, and it has, likewise, only creeping roots, but no tap root, which is necessary only for trees proper. But as in this peculiar kind of root lays the reason of its slow shrubby growth, so does it constitute its great usefulness for fruitful dwarf trees. The propagation of the paradise apple is, like that of most other shrubs, from suckers. These it often throws up, even when grafted in large numbers; not, like the plum tree, from its distant feeding roots, but mostly from the neck of the root; sometimes, also, from the stronger roots near it. By these suckers we can propagate it abundantly for our nurseries, and they have the peculiarity, by which they are specifically distinct from suckers of seedlings, that even the smallest, scarcely of the size of a crow quill, immediately pushes forth its own roots, so that they, also, do little harm to the parent tree.

* Why the author, dividing the class pyrus into the two pomological classes of apples and pears, does not also divide the class prunus into plums, peaches, apricots, and cherries, is an enigma to the translator.

To raise paradise apples stocks from cuttings, as some propose, I will advise no one to try, for I must say that I have not yet succeeded in raising a single one in this manner. Even if such cuttings seemed to thrive the first season, they invariably died the second. The stump in the ground never had a root, but cankerous all over. The way in which roots form on the *French* paradise apple is quite peculiar to it; namely, on the neck of the root form first small, but often a half inch wide, oval or round protuberances, which have much similiarity to roots. From these grow out numerous small, beard-like swellings, which all elongate into fine feeding roots, not unlike a beard. If such a tree is placed near a moist, shady wall, these beard roots will even shoot out in the open air towards the wall, and take hold in its crevices. So, also, these roots are often seen creeping on the surface of the ground, which should be well remembered in digging, especially when suckers are desired.

These mere fibrous or feeding roots are the cause why trees grafted on such stocks make no rampant growth, and, therefore, by the slower air cultivation of the sap, soon form numerous shoots, (Lambourdes) and fruits spurs, (Brindilles,) which, through the manner of their growth and position, are protected against the vertical impulse of the sap in so far that the checked circulation of the latter permits the formation of innumerable annular swellings, (Bourrelets,)* which are inexhaustible in fruitfulness.

It should not be supposed, though, for this reason the whole tree grows too slow. The leaders for the enlargement of the tree have, nevertheless, a lively growth, and often make summer shoots of from one to four feet long. Of this wild apple shrub we have two varieties, perhaps, and probably even three. The first is the paradise apple proper, which I call the French, and which is generally disseminated, and well-known to every gardener. To this variety, apples particularly the characteristic just given, especially in regard to the oval protuberances. This variety is the smallest, has the most beard roots, (chevelure,) and the leaves are of a dark green, glossy, deeply indented, small, and lancet-shaped.

In Holland the second variety is found. The roots of this are stronger, the bark of older trees resembling that of the hawthorn, and the roots, although also growing in bundles, are less abundant, and do not spring from those warts, which even in the open air run out into roots. The leaves are of a light green, are softer to the touch, and of an oval shape, pointed at the end, deeply indented with an undulating edge, (folia undulata.)

* These annular swellings are one of the most remarkable contrivances of nature in the vegetation of fruit-bearing trees. They are intended as dams against the impetuous flow of the sap. Every twig of a tree, which is preparing to bear fruit, has its own economy, for the elaboration of the sap for its own end, and to prepare it for the fruit. The sap flows slower through the swellings, which are in reality the natural product of the scales of the leaf and fruit buds. The former have only a few, the latter many more scales; therefore the more or less visible annular swellings. I will here remark, that when dwarf trees are pruned so closely, that these swellings disappear and grow out into leaders, then the pruning is faulty. In this consists the unwise summer pruning, where no resisting annular swellings have formed yet.

The annual summer shoots of this are of yellowish green, of the former variety of a reddish brown. Suckers are as abundant with the Dutch as with the French variety.

In France this Dutch variety is called Doucin;* also Doucain and Fichet. They are used principally for half-standards.† For in rich ground this variety grows nearly as rampant as the strongest seedling; with the difference, though, that they very early become fruitful. Fifteen apple trees grafted on Doucin, which I received from Harlem, all bore the third year. This is the Doucin, which the English botanist and scholar Miller does so much justice in saying that less than twenty feet distance on a trellis will not do for it.

The third variety seems to be the "Hedge apple" of several German authors; but as I have seen none of them, I can say nothing about it. Von Munchhausen thinks it is identical with the Doucin, but this is not probable.

In the French paradise apple we have an incomparable subject for apple trees in pots. Its roots, not rampant and wild, being all fibrous or feeding roots, may be checked in any degree; for after the laws of nature, a curbed power of root causes early fruitfulness and shortened life; while, on the contrary, a wild, rampant growth insures longevity and late fruitfulness. For this reason, all trees planted on the side of a mountain, or in good but shallow soil resting on rock, become fruitful very early.

If, now, paradise apple stocks are to be prepared for pot-trees according to the rules of art, the principal rule for them, as well as for all other kinds of stocks for all other kinds of fruit, is: *To induce a large number of fine feeding roots to spring from a short piece of the main root or neck.* As the length of the main root can never be more than three or four inches for a pot eight or nine inches in depth, it happens often, that the stocks have but few roots on this length, which must, therefore, be produced by art, namely, by transplanting; for the more feeding roots we have on the short piece of main root, the more pleasure shall we derive from the merry growth of our trees.‡

Young stocks or suckers, not over half an inch thick, smooth and free from any hard crust, must, therefore, be chosen. Of these the main root is cut back to two or three inches; the small roots remaining over the cut are also cut back to one inch or one inch and a half; and now, when the top has also been cut back, the tree is planted in the nursery, one inch deeper than it stood before, to prevent it suffering from drought in the summer. In planting care must be taken that these fine roots are well spread horizontally, for, otherwise, these fine beard-roots are apt

* See Du Hamel, Pomona Gallica, vol. ii., p. 43.

† See Nouvelle maison rustique, vol ii., p. 149. Paris, 1721, (a work of two large quarto volumes.)

‡ For dwarf trees in the garden, or trellis, or as pyramids, the contrary holds good. Here it is necessary to have a forest of feeding roots to sustain the larger tree. For trellis, at least one foot of main root is required, and for pyramids, where the graft must absolutely come in the ground, if they shall be able to resist the winds, 18 inches are not too much.

to cling to the main root, which often causes their decay. Crippled stocks with injured bark never succeed.

When such a little tree has stood one summer in the nursery, and grown well, and it had already good roots when it was planted there, it may be budded the same summer or grafted the next spring. But if it had no fine roots when it was planted, it must be taken up and replanted next spring, when the new roots are also cut back again. In this case, a tree is to be expected that will have, as it were, a forest of feeding roots, and with them the properties necessary to make it a perfect pot-tree; for each cut root will throw out numerous smaller ones.

But often this replanting is not necessary, and many paradise suckers are found which have sufficient roots for our purpose.

If, however, our conjecture in this respect has proved erroneous, and the trees already grafted, are found to have too few roots in taking up, they must be replanted in the nursery, according to the above rules for stocks. In this case we not only save a year, but, for obvious reasons, the tree will sooner become fruitful. I transplant my trees intended for pots, every spring, in March, by which means they soon set many fruit buds; but of this in the chapter of vegetation.

But never must an amateur, who expects undisturbed pleasure for many years from his pot-trees, plant Paradise stocks, much less any other kind of stocks, in pots, to be grafted in them. Instead of gaining hereby, there is much loss; for, not calculating that the tree, grafted the same year, does not thrive so well, often very poorly, it exhausts the soil in the pot at least three years too soon, unnecessarily and without any compensation. The pot becomes too soon cramped with roots; and when, in the third or fourth year, the tree has formed a crown and fruit buds, it also often begins already to lose in vigor. It must, therefore, be transplanted, and, at least for one year, all pleasure and enjoyment are lost. But if the tree has first been two years in the nursery, and been carefully transplanted there every spring, I get a tree with a crown full of fruit buds, which will yield the finest fruit for five or six years.

It is, therefore, a general rule to plant the stocks first in the nursery, to graft or bud them there, and then to leave them for two years, either undisturbed or transplanted every spring, for the development of their roots and crowns. The first year's growth of the graft is to be properly pruned back the next spring, by which we obtain in the second summer the proper branches for a crown, which we obtain neither so numerous nor strong in a pot. In the fall the tree may be potted, but better not till next spring, because we then save several months of trouble. But never must a tree that has been potted in the fall, nor any other newly planted fruit tree, be pruned at that season. The slow circulation of the sap is better sustained by the branches, and one runs no risk of losing just that bud by frost, which by the next season's growth was destined to form a new branch.

After the second season's growth in the nursery, the little tree is generally well

developed, and after potting often bears fruit the same year, though oftener only blossoms, which fall off again, because the tree is not yet well rooted in the pot.

This was the general rule. But the case is widely different with the student, with whom pot culture is not the end, but the means. If he, solely for the study of varieties, wants to experiment with a new or unknown variety; if it is enough to see the fruit once or twice, and observe the manner of vegetation of the tree, to enable him to form a judgment and make comparisons, then two years saved are important. In this case the grafted trees may be potted the first year, or some Paradise stocks may be potted yearly in advance, to be grafted in the pot. Nay, if this has been done in the fall, they may be grafted the following spring, or even grafted and potted at the same time. In this case the regular shape of the tree, which can only be obtained in the nursery, is of no consequence; but instead it may be tried to develop the future fruit buds even the first season, by pinching in the young summer shoots.

He who has observed and meditated on the advantages and disadvantages of the vine fretter or vine pricker, (Curculiones longinoster, long-billed snout bugs,) will easily understand this artifice. These are mostly busy before July. After they have pricked off a vine, the next bud generally pushes out in a week, and forms a summer shoot. But not seldom, and with stone fruit and pears nearly always, not only the next, but several buds come into activity, which otherwise would have pushed only next year, or perhaps never.

If, now, a summer shoot of a healthy growing tree is pinched in before July, at about that bud where it would have had to be pruned next spring, we obtain fruit spurs one year earlier, which often blossom and bear fruit the next year.

In regard to grafting, I will only add, that this may be done as high up as where the crown is to form, and the best height for this is from 10 to 12 inches. For dwarf trees for the garden, on the contrary, the paradise stock must be grafted very near the ground.

If the paradise stock has been potted only the preceding fall, or only in the spring when it is grafted, the graft only makes one or two weak shoots. But if it has grown in the pot for one year previous to grafting, a bud will make a strong shoot, and a graft two or three. These shoots are permitted to grow till the middle of June, when they are pinched in one half. They will now make enough side shoots to form a crown the same year, and apples and pears will even often make fruit buds.

Summer pinching is for dwarf trees as important as pruning in spring, and is based on the same principles. Its purpose is to give trees the proper shape; to render the pruning easier; and to strengthen the necessary shoots.

[At this time, when the culture of fruit trees in pots is taking its place as a specialty, the above remarks from Diel will be read with much interest. Though written more than seventy years ago, they still have a degree of freshness, and

agree mainly with the best practice of the present day. That some progress should have been made in this long interval was to have been expected. As we expect to give further extracts, our remarks may as well be reserved for the end.—Ed.]

INTERIOR VIEWS. No. 2.—EXOTIC GRAPERIES.

BY FOX MEADOW.

How beautiful is the external! Art and wealth combined have produced a most lovely effect upon the lawn, or in some cozy part of the grounds where it pleases the taste of the proprietor. This little beautiful fruit structure is a very graceful ornament, and all visitors admire it; indeed, they are fascinated, and led to exclaim in the moment, "What is that beautiful glass structure for?" "For the growth of grapes," is the reply. At this moment curiosity knows no bounds, and away rush our visitors to see the beautiful grapes. But what is the spectacle inside this charming house? the eyes are strained in looking for grapes; but, alas! none or few are to be found. The only prominent feature the visitor becomes cognizant of is the fumes of sulphur, or some other "special antidote," which would seem to be an ever necessary concomitant to the inside of beautiful graperies. What a wonderful contrast between the *exterior* and *interior* of some of the costly graperies! We have seen many this season where the name "culture" is a disgrace to horticulture. A grapery, when once planted, would seem to have an act of Congress reigning over it: thus plant; thus shalt thou ever remain! I do not recollect whether our forefathers embodied a clause in the Constitution bearing on this point; but if such should prove to be the case, can it not be broken? Suppose we "secede" from such a "very tyrannical" form of things, and set up for ourselves, shall we be let alone? You will guarantee our safety, Mr. Editor, so we will proceed.

That failures in grape-growing exist to a greater or less extent, none will deny. Now what are the causes? This part of the question we propose to examine a little in detail, and as briefly as the nature of the subject will admit.

The causes of failure in grape-growing are presented to our mind thus: the wrong in border-making; the wrong in planting debilitated vines; and, lastly, a little wrong arising from inexperience. If I should tell the readers of this journal that ninety vine-borders out of every hundred of those of present date do not contain ten per cent of the vine's *feeding*-roots, they would, no doubt, feel surprised. This, however, is my opinion. A good rich border—good rich loam—plenty of rotton dung—bones, and a great many other things, constitute the border of a great majority of our best practical gardeners in Europe as well as here. My experience in this vine-border making is, that *the richer the border is made, the*

quicker the roots run out of it—the quicker such a border becomes useless to the plant. The roots of grape-vines, when growing in any good ordinary soil, are not small and fibrous, but long, resembling so many whips—feeding from their very ends principally; and, consequently, when young vines are first planted, their roots extend in direct lines as rapidly as possible, *because* the elements necessary to the plant's growth *are found in every particle of soil the absorbing spongiole touches;* and hence, these roots drive on in direct lines, and never turn to the right or left until the gross elements they were previously feeding on, cease to be. Now it will be evident to any intelligent person, that as soon as the stimulants cease to surround the spongiole in its onward driving movement—the instant the food is not to be found at the root's mouth, another action of the root ensues, which is this: the sudden bursting forth in all directions from that long, straight root, of an innumerable host of foragers; like soldiers in an army, when food is not to be found in one direction, they divide off into all parts of the country, which results in the end in the collection of vast supplies. Now, it will be easily seen why our fine rich borders do not contain the feeding-roots of the vines, and why it is that such numbers of vine-roots are always found in poor, miserable soils, *outside* of the rich borders. There is no way but one of keeping the roots in such rich-made borders, and that is to wall up in cement, and concrete the bottom. This, however, is a useless expense.

Look, for instance, at the loads of rotten manure placed annually on many vine-borders, and no perceptible difference seen in the crops of fruit, neither in the foliage nor wood. The feeding-roots are outside the border, and this gorging with rotten dung is constantly being applied to the conducts—mere conducting water-pipes, that can not be influenced one way or another by its application. All the fine expensive drainage to such borders are just as useless as are the rich materials of which they are composed, and the only direct influence such borders have ever had on the vines planted in them, would be, perhaps, for the first and second season, inducing coarse, heavy, long-jointed wood, to be miserably half-ripened in the fall of the year, bursting forth the next spring into puny insignificance. It is true that where the soils outside of the borders are moderately fertile, the roots extend in direct lines, as when first coming through the border, and thus for years maintain a good healthy growth, which, I have no doubt, causes many to suppose that their borders are of the No. 1 class; but a tracing of the roots would soon reveal the true secret of affairs. This action of the root we have just illustrated is dependent *solely* on the *quality* of the plant when first planted. If the young plant is strong, having large, long, and strong self-supporting roots, their action in the rich border will be just as we have described; but if the plants, when first planted, are poor, miserable things, called two and three years old, being grown, or rather kept *dying*, for that period, in four and five-inch pots, whoever gets them, they are to all practical purposes *rootless*. Now the action of the roots of *this* class of vines in borders of the order named, is just the

reverse of the former. It should be remembered that vines having poor, half-dead roots when planted, never resuscitate; they remain for years in almost the same condition, but die ultimately. Plants of this class, if planted very early in the spring, remain in *statu quo* till June or July before showing much symptoms of growth, and then weakly; but as the weather increases in heat, the plants increase in strength, until they make what appear to be strong vines by November. Such vines, let their apparent strength be what it may, are worthless as good fruit-producing vines. And why? Because such plants are no better than rootless cuttings. The roots they possess do not contain a sufficient amount of organized matter to sustain and push strongly the bud intended to form the cane or young rod; and consequently, after the bud has pushed forth, and exhausted the organized fluid in the woody portion of the plant, such roots can not supply further resources, and the plant remains in the same state, until, like a cutting, it pushes new roots out of the wood at the base or the collar of the plant. The new roots, as they issue forth, become very strong, but *invariably* they go direct to the bottom of the border. They are, in fact, so many tap-roots. They grow downwards just as do Parsnips and Carrots, nor do or will they stop in the descent, if the border be open and porous, no matter how deep, until they strike the hard bottom; then they turn and run along the bottom. Now of what use to such roots are all the costly materials of the border? The greater the amount of rotten dung such borders contain, the greasier they are, the more impervious they are to air, and, consequently, the quicker is disease in its various forms brought on in the plant. Roots can no more live without the influence of the atmosphere than can leaves; consequently, how can we expect good results out of such deplorable conditions? From this action of the root arising from, and dependent on the quality of two classes of plants used, we would ask, What per cent. of the rich, gorging materials that borders are composed of is absorbed by the vines said to be growing in them? Is there a fair compensation for all the "old sod," rotten dung, guano, lime, bone, superphosphates, special fertilizers, and perhaps dead horses? Would there not be more realized from ordinary ground by growing common vegetables than is realized from many of our fine grapery borders, in proportion to capital invested? From these remarks our readers will, we hope, be led to see where *two* of the great wrongs exist in the culture of the exotic grape under glass; which is in one instance owing to the roots being directly at the *bottom* of the border and *under* the compost which they should be in, up, and working through; and in the other case having grown directly *through* the border and to the outside; and that owing to such results in both cases, the expensive food prepared and placed for the plants is not consumed by them. Having hinted at the wrongs and the causes which produce them, we shall next hint at the remedies.—(*To be continued.*)

[Fox Meadow has here opened a very interesting and suggestive aspect of the

grape question, and we shall wait impatiently for its conclusion. In the mean time, we hope his professional brethren will study it attentively, and send us any conclusions it may suggest. Fox Meadow is evidently minded that neither himself nor grape-growing shall stand still; he is manifestly of opinion that all the mysteries of grape culture have not yet been mastered. To us, such manifestations on the part of old and experienced gardeners, augurs well for the progress of the science of horticulture. Who would lag behind when every thing is progressing? If in any matter, however small, we have been wasting our capital and labor, let us find it out as soon as may be.—Ed.]

THE CIRCULAR CURVE.

BY JAMES HOGG, YORKVILLE, N. Y.

I accept with pleasure your kind invitation to put in writing the verbal criticisms which I made in conversation with you, upon Mr. Woodward's articles upon curved lines.

On page 158 (April Number) Mr. Woodward says: "We do say that compound *circular* curves are practically identical with any curve that can possibly be made use of in any department of landscape adornment, and that there is no curve known, or gracefully flowing line, but what is rigidly mathematical;" and at page 299 (July Number) he says, "It (the circular curve) can be made to pass through any point, adapt itself to any form of surface, and admits of the safe passage of heavy and rapid moving bodies, and for graceful flow and elegance is quite as near perfection as can be attained. To any one who has made a practical examination of curved lines of road laid out by the eye, and compared them with those actually laid out as portions of *circular arcs*, there can be no question as to the superior elegance of the latter; the difference is so plain, the grace and beauty of flow so decided, that a doubt is not admissible."

Now I take issue with Mr. Woodward in this, and shall attempt to prove that the circular curve is not the curve of "graceful flow and elegance," and that in landscape garden practice it is not adapted for the "passage of heavy and rapid moving bodies." I assert that its elements can not be used as elements in laying out other curves, because they are diverse from them, and governed by altogether different causes and principles. That in laying out other curves, such as the ellipse, the parabola, the cycloid, the catenary, the epicycloid, the hyperbola, etc., in the manner indicated in Mr. Woodward's articles, he is only working by the rule of compensation of errors, which, while they neutralize each other, do not develop the truth.

This is not the place for positive mathematical demonstration of my assertion,

as at present we have to do with the circular curve more as a matter of æsthetics than of mathematics; but let me observe that the circle is not, as Mr. Woodward appears to consider it, the elementary principle of the cone, which is a combination of the triangle with the circle, but that it is rather the elementary principle of the sphere, the circumferential line of any section of which is always a circle, and can be no other figure. The sphere in physics conveys or suggests the ideas of perfection, ponderosity, and quiescence, because it appears as a complete, finished body which will make no further progress in development, and appears as being unacted upon by extraneous counteracting forces. The moment it is acted upon by forces sufficient to overcome the mechanical cohesion of the materials of which it may be composed, it immediately assumes other curved forms, the spheroid and its varieties, the parabola, the cone, the cylinder, the hyperbola, etc., etc., as the case may be: the elements of these curved forms being those of matter in motion, and not at rest; and these elements being produced and governed by laws and principles as diverse from each other as rest and motion are.

The circle being an essential, elementary portion of the sphere, it partakes in its due proportion of the characteristics of the sphere; it incloses the largest space within the smallest circumferential line, and so far is perfect; it is without beginning or end, and so far is complete; and it suggests neither progress nor motion, as, on account of its perfect form, it indicates either having overcome all forces producing motion, or incapacity of being acted upon by such forces; in either case suggesting a state of quiescence.

Now in laying out walks and roads we have to do with bodies in motion, and not at rest, and in order to avoid incongruities and discord of form, we must adopt lines which are produced by, or are in accordance with, the laws of motion or progress; and not with those in accordance with matter in a quiescent state.

As an inclosing line for flower-beds, fountains, statues, monuments, and similar purposes, the circle and its combinations are most beautiful and satisfactory; but for roads or walks it is of all others the most disagreeable and unsatisfactory to a cultivated eye. To reverse two semicircles, joining them at the tangental point, is to dislocate or destroy that which in its proper place is perfect, and so produces an unpleasant emotion in the mind: the very thing to be avoided in all artistic landscape scenes.

Engineers may generally use the circular curve in their operations with tolerable satisfaction, as their works are ordinarily of such a character and on such a large scale that the eye does not generally take in the whole of the curve at once; besides this, the long perspective destroys the bad effect of the curve. But in cases where the eye takes in the whole of the circular curve at once, or the mind instantly comprehends it, the effect is unpleasant.

I can not call to mind any instance in nature of a perfect sphere or circle. The rotation of the earth upon its axis causes it to assume the form of an oblate

spheroid, and every thing upon it partakes of forms either original, in combination, or in modification more or less produced or governed by forces causing motion. Not only so, but none of the orbits of the heavenly bodies, or any of their lines of motion, are in the nature of circular curves—they are all curves of motion.

I do not recollect of any painting or piece of sculpture of acknowledged beauty where the circular curve is introduced; and as a fixed matter of taste, the more flowing and delicate the curved lines in a picture or work of art, the more it is esteemed and admired. I think you will admit that the lines in the Laocoon, the Venus de Medicis, the Apollo Belvidere, the Antinous, Niobe and her Children, the Dying Gladiator, and other world-renowned statues, are full of grace and beauty, and yet not one of the lines entering into their composition is a circular curve, nor would any artist ever attempt to lay out their lines by or with a pair of compasses. The ancients well knew the comparative value of flowing curves, (or curves of motion,) and of circular curves; they used the former in their highest and most spiritual works of art, and the latter in their lower works, as in statues of Silenus, Hercules, Bacchus, etc., where, in the roundness of the head, the belly, the calves of the legs, etc., a low degree of intellect, and a certain amount of grossness are admirably indicated, and which it would have been utterly impossible to have indicated by the other class of curves.

I do not think Mr. Woodward himself would endeavor to lay out a pure Ionic volute, or a beautiful winding stairway, by any such application of circular curves as he recommends to garden artists. That curved lines of every class are strictly mathematical, or may be resolved into strictly mathematical lines, I do not dispute: no line, from a dot upwards, nor combination of lines, exist, but may be analyzed and reduced to their proper mathematical elements and value.

I will give you a few practical illustrations of the effects of the two classes of curves, which will strike the most inexperienced eye. Compare the full-breasted Dutch galliot with semicircular bows, or the old-fashioned, tea-kettle-bottom ships, with the clipper ship of the present day, with her flowing curved lines; the one built for carrying, the other for fast sailing. The one class certainly inclosed the greatest quantity with the smallest circumference; the other class competes with the winds in swiftness. Which is, artistically speaking, the most beautiful in outline? can there be a doubt as to the perfection in beauty of its kind, of the clipper ship? but are her lines not those which study and experience have taught us are the lines produced by a body passing swiftly through the water?

You can not go five hundred feet on the Central Park without meeting with notable instances of the incongruities and deformities produced by the adoption of the system of circular curves. The Park has been managed and laid out by lawyers, brokers, merchants, farmers, engineers, architects, and literati. From its counsels and direction, in any shape or form, all artistic or horticultural skill has been studiously, constantly, and continuously ignored; and not at present to

refer to the results in other matters than those of the lines of the roads, there is not a consecutive hundred yards of curved walk or road on which either the pedestrian or the vehicles follow the lines of the roads as laid down. It is a very interesting and instructive study for the landscape artist to note and contrast the natural and therefore beautiful lines formed by the vehicles or pedestrians on the roads, with the lines of the roads themselves; so in opposition are they, that even the water-cart horses have to be forcibly compelled to deviate from the natural and therefore true line, in order to regularly sprinkle the roads.

In concluding, I would again call attention to the fact that the circular curve does not exist in nature or among the celestial bodies, as far as we have cognizance of them; that it has never been used by artists of true genius or taste for the production of lines expressive of sublimity, of purity, or of beauty; that its elements being those of a quiescent body, are not, and can not be made properly serviceable in deducing the lines of bodies in motion; and that such lines can not be truthfully laid down by any system or combination of circular curves; that the true lines or curves of beauty are those composed of the various curves of motion harmoniously combined and laid out by their own proper elements, and so brought into accord with those natural surroundings which nature furnishes us for the adornment of rural scenes. The moment we introduce other forms we make discord and produce incongruities. He succeeds best who brightly illuminates his work by the lamps of Truth, Power, and Beauty; if the first is at all dimmed, the others will be more than correspondingly darkened.

The art or science of engineering is a noble one, but when it steps from its own proper sphere into that of art, insisting upon the adoption of its formula and theorems exclusively, it becomes empiricism. Its rules and practices should be subordinate to æsthetics, and should be adopted only in so far as they assist in aiding and carrying out the designs and requirements of artistic taste; beyond this, they are, in such matters, not to be recognized.

The practical and material modes of thought of our day, and the great achievements of engineers in the legitimate line of their profession, have rather led the public mind astray, and made it to ignore the proper claims of the artist. Not all the knowledge of engineering science in the world would ever make an artist; he may be compelled to study engineering to enable him to carry into effect his thoughts and ideas, but there is nothing in engineering to suggest the beautiful; it has to deal with immutability, (so to speak,) compulsion, the intractable; it overcomes, but does not create; the true artist creates and overcomes. Many of the old painters were architects and engineers, but that did not impel them to produce those sublime works which challenge the admiration of the world; others had equal, perhaps better scientific knowledge, but they have left no such monuments behind them.

[Learning, in conversation with Mr. Hogg, that he entertained views, in regard

to the circular curve, quite at variance with those expressed by Mr. Woodward, we requested him, in a note, to put them on paper, and he has done so, for which he has our thanks. Mr. Woodward will respond in our next number. We believe the discussion of this subject will prove highly interesting and instructive to a large class of readers. It remains to be seen whether these gentlemen will leave us any room for remarks.—Ed.]

THE ROLLING PRAIRIES OF THE WEST.

BY COGNOSCO.

It is the universal impression among western men that all writers have utterly failed in describing a prairie; at least, it is a rare thing to find one who has never seen a prairie whose conception of it is any thing like truthful.

The prairie lands of the West form a very large and important feature in the inducements to a new settler, their immediate cultivation giving him a start unattainable by long years of labor and deprivation in a heavily timbered country. The facility with which the prairies can be subdued, the abundant returns they yield, and their surpassing beauty and attractiveness, have enabled the States of the West to attain in twenty years a condition that has required a century in the older States. While a life-time is required in the East to cut down forests, remove stumps and rocks, and bring a farm into handsome shape, it is no uncommon thing at the West to find, in a single decade of years, that an energetic man has made and sold a half dozen farms. Possessed with that unexplainable fascination always connected with frontier life, we find pushing on westward, men who have made farms in Ohio, Indiana, Illinois, Wisconsin, Minnesota, and Iowa, still westward bound with a keen eye for a mill-power, a town site, or a country seat, which they readily dispose of to the next wave of emigration.

The rolling prairies of Wisconsin, Northern Iowa, and Minnesota, are very similar in character, and, strange as it may seem to an eastern man, occupy some of the most elevated portions of these States, and are destitute of that tall grass out of which novel writers have woven such frightful stories in their description of prairie fires.

The character of the prairies in the three States named, is chiefly undulating or rolling, although, in some of the western counties of Northern Iowa, there are long stretches of comparatively flat or level prairie lands. This rolling tendency is not on a horizontal line, but gradually ascending to a high elevation, and then gradually descending. Thus Koshkonong Prairie, in Dane County, Wisconsin, attains an elevation of between 500 and 600 feet above Lake Michigan, and the views from it, over valleys and timber, highly cultivated farms and flourishing

villages, is of the most extended character. On Rock Prairie, lying in the always charming valley of the Rock River, are some elevated portions of prairie land that command the most enlivening vistas of busy western life. The flourishing city of Janesville, the long lines of railroad, and the vast fields of waving grain, excite emotions of surprise among all who see them for the first time. The prairie at Monroe, west of Janesville, attains a height of 500 feet above Lake Michigan, and from thence running northward, the prairie rises until it almost reaches the summit of the Blue Mounds, upwards of 1,000 feet above the lake. From this point the view is magnificent. Some 40 or 50 miles distant, over the rolling prairie, interspersed with oak openings and bodies of timber, are seen the dim outlines of the Platte Mounds, up whose sides climbs the swelling prairie; and from thence still onward looms into view the Sinsinawa Mound, the last prairie land-mark east of the Mississippi. Crossing the great river, fifteen to twenty miles, and we are again on the beautiful prairie, now 600 feet above the river, its undulatious rising and falling like a heavy swell on the ocean; now dipping into the wooded valley of a stream, then rising to the summit, then again descending, it rolls on westward, gradually rising, until, in Cerro Gordo County, 130 miles west of the Mississippi, the elevation is upwards of 700 feet above the river. There are seldom any abrupt breaks in a rolling prairie, except as it approaches the valley of a stream, or rock or gravel crops out. The swells are usually rounded, and grassy slopes and dimples flow gently together.

The prairie soil, as a general thing, is dry, and exceedingly rich and fertile, easily cultivated, and admits of the use of all the improved agricultural machinery. Plowing is done with a fraction of the labor required among the stumps and stones of an eastern farm. Although it is usual at the West to speak of the prairie in its native condition as wild land, it is in that form more easily cultivated than improved land at the East, and, except in the matter of buildings and fences, a farm can be made with less labor and less money than one can manure and cultivate what are called handsome farms at the East; in fact, such wild land, of almost inexhaustible fertility, can be purchased within less than ten miles of a railroad depot, for about the same price per acre as it costs to manure land at the East; say from $800 to $1,000 for a quarter section of 160 acres.

A rolling prairie is seldom very extensive. It may have great length, but not width. Groves of timber are almost always to be seen, and one does not often get "out of sight of land," as on the more level prairies. Rolling prairies are usually well watered. We have seen in the course of a day's ride innumerable ice-cold springs. Fountain Prairie, in Columbia County, Wisconsin, is so called from the number of springs and spring brooks that are found on it; and at Waukon, the county seat of Allamakee County, Iowa, which is located on one of the most beautiful of all prairies, some 600 feet above the level of the Mississippi, are perhaps a dozen or more handsome springs, gushing up in the streets,

and in different parts of the village. Union Prairie, Washington Prairie, and many others we might name in that vicinity, are remarkably well watered, as well as unequaled in that indescribable beauty belonging only to rolling prairie land.

But we must make another article on this subject; it is too vast to be disposed of in a hurry. The Prairies are destined to form a very important feature in our Agricultural and Horticultural wealth, and, in spite of all the misrepresentations about the hardships and privations of Western life, will become the most thickly settled and wealthy portion of our land.

[Whatever misconceptions may have been produced by the highly wrought descriptions of novel writers, the readers of the HORTICULTURIST at least will now have a just idea of the magnificent prairies of the West. That many false notions exist in the minds of those who have never seen a prairie, can not be doubted; and it is equally not to be doubted that these notions have been legitimately drawn from the sources alluded to above. Cognosco has toiled over them time and again on foot in the pursuit of his profession, and has thus acquired a minute knowledge of their formation and general appearance which no mere passing traveler could hope to attain. We shall look for a continuation of the subject with much interest.—ED.]

GRAPE RAISING ABROAD.

BY PROFESSOR SMITH, NEW YORK.

IT is self-evident to one familiar with the grape-growing regions of the old countries of Europe and Asia, that certain parts of the United States are destined, in the progress of civilization, to become eminently distinguished for this peculiar department of industry.

Notwithstanding the comparative small amount of wine manufactured in this country, at present, and considering we are a young people, the amount is beginning to attract a marked attention. If Mr. Longworth has been successful, many thousands might be equally so, and upon the principle that straws indicate the course of the wind, the wine-making of Ohio, and a small domain under culture in Missouri, show what may be accomplished, ultimately, over a vast extent of hill and dale.

Parts of the United States are destined, as agricultural knowledge is diffused, to become great wine-making sections. This is assumed to be entirely susceptible of demonstration; but it is not worth while to discuss that point, beyond declaring at the outset, nature has nowhere given stronger indications of a soil admirably adapted to vineyards, if the varieties of native grapes growing spontaneously from

the forty-fifth degree of north latitude, to the Gulf of Mexico, in one direction, and from the Arctic border to the Pacific Ocean in the other, are to be regarded as the testimony of nature herself.

But my first object is to describe the method of grape-growing in the oldest country in the world; first, because it was where man was first engaged in the peaceful labors of horticulture, and his eminent civilization is traced to the commencement of hand-craft in a garden under the special direction of his Creator.

The writer of this paper has traversed the far-off land of ancient Syria; examined with the curiosity of a traveler, its geographical features and its unrivalled agricultural capacity, and, therefore, deals with facts and not with speculations. As the particular object of this communication is to treat of the grape, other and certainly interesting topics that could not fail of being of practical utility to our own industrious countrymen, must necessarily be passed over, for the present at least.

In the book of Genesis, the minute account of the size of the Eschol clusters, which the spies brought into the Jewish camp, slung on a pole between two carriers, furnished a clew to the condition and development of that excellent fruit, in the Land of Promise, at a remote period in the history of humanity.

One hardly dares to assert that the vine is equally prolific and gigantic there to-day. Such, indeed, is the fact, where the smallest amount of care is given to its protection, and any reasonable amount of encouragement is bestowed on the vines.

Unlike the grape culture of Italy, by festooning the vines from tree to tree, at intervals of a rod or two, or the German mode, of raising the shooting shaft up the side of a pole, like string beans, in the Holy Land the roots are set out in a rocky, but rich valley, generally tolerably secure from raging winds. After the vine begins to run over the ground, the roots being from four, six, and sometimes nine rods apart, the centre or first leading vine is cut off, almost level with the ground. The lateral limbs are then permitted to strike off from the common centre, in all directions, resembling the spokes of a wheel, radiating at all points of the compass. Those are permitted to creep off almost indefinitely, so that the surface is occasionally seen quite covered by an interlacing net-work of vines, as complex as a melon bed. On the hard ground, basking on bits of rough limestone, the berries lie securely, undisturbed by sudden blasts of the storm; swelling and ripening beyond any examples here or in Europe, even under the best auspices of the gardener.

Here is a point that is deemed of transcendant importance in reference to vineyard planting at the West. Missouri, an immense tract of prairie in eastern and western Kansas, and very choice sections of Nebraska, are yet to be the great wine-making regions of North America, on this side of the Rocky Mountains. The prairies are not understood even by western farmers. Valuable as are their crops, when the vine is systematically planted on them, as they will be, one single acre will yield a far greater return in a single season, than ten ever did in wheat, corn, or other familiar products.

The Syrian method places the cluster beyond the contingency of sweeping winds, the first obstacle to contend against in raising vines on poles, Rhine fashion, or giving them the look of clothes-lines, as throughout Italy. At Herman, on the Missouri river, where Prussian vine dressers are thriving by making admirable hock, I feel convinced their profits would be enhanced by simply introducing the Palestine system.

It is because the writer foresees in the future, how this successful branch of industry is to flourish on the far-extending prairies, that he dwells with more force and pertinacity on this, in his view, great subject. Following the simple, but in all respects, safest course on flat sections of the country, or rather where a sudden blast of wind, from acting against the swinging cluster, either breaks it off, or blights the berries, the happiest results would follow.

Such is the bounty of the harvest in Syria always, and it must have been so for ages, that the writer has had wine, rich, luscious, and nutritious, on the table in Jerusalem, which could be afforded at fifteen cents a gallon. The juice was pressed out by exceedingly rude apparatus, the grapes having first been brought from villages by the Arabs. And there is no reason why the same economy might not be practiced here. We have hardly commenced thinking about wine-making yet, but that time will also come. Wine and temperance are the characteristics of Syria. More of this, however, on another occasion. To be sure, Mohammedans do not drink wine, but others residing in their midst do, who are proverbial for their sobriety, industry, and probity.

[The above is from a gentleman who has traveled extensively in the East, and with an observant eye. So many associations cluster around the history of the grape, that something fresh from the land of its home will be read with peculiar interest. We should be very glad to have the subject continued.—Ed.]

RAISING SEEDLING STRAWBERRIES.

BY A. S. FULLER.

How Seedlings are Produced.—In attempting to produce a new variety of strawberries from seed, it should first be decided what are the qualities desired, and then, by selecting two varieties that possess these qualities as near as may be, and by fertilizing one with the other, we can come nearer to the object in view than we should by sowing seed collected indiscriminately from varieties not properly fertilized.

For instance, let us take the Wilson, which is very prolific, quite large and firm, but is rather acid, and too dark color, with a calyx that does not part readily from the berry, and the Peabody, which is not prolific, though large, and is of superior color, and sweet, and has a calyx that parts readily.

Now, let us place these two varieties at some distance from other varieties, but in close proximity to each other, so that they can be the more readily operated upon. When they come into bloom we remove the stamens from as many flowers as desired, and then with a fine camel's hair pencil take the pollen from the other variety, and dust it over the pistils of the flower from which the stamens have been removed. It is well to place a fine netting over the plant operated upon, to prevent insects from fertilizing it with pollen from inferior varieties.

The flowers should have the pollen applied several times, a few hours between each application, so that the fertilization shall be complete. It is well to use both varieties as parents, and fertilize the Wilson with the Peabody, and vice versa, as it can not be determined which will produce the best until proved by actual experiment. I do not mention the Wilson and Peabody believing them to be the best to raise seedlings from, but only to illustrate the principle. From my own experiments with them I have been somewhat disappointed, for nine-tenths of the seedlings from the Wilson fertilized by the Peabody were more acid than the parent, although I succeeded in getting the color, and some of the other characteristics of the Peabody. But using the Peabody as the parent, I have had better success—getting a better colored berry, sweeter, and some plants that were quite prolific, with almost invariably the long neck, which is a peculiar characteristic of the Peabody.

Two varieties of the same species, or two distinct species, (unless too far removed, like the Alpine, which I believe will not hybridize with any of the others,) may be brought together and valuable varieties grown from the mixture.

But it must be remembered that the varieties now in cultivation have been so mixed and cross-fertilized that it is almost impossible to get a true cross between any two varieties.

The effect of fertilization of previous generations will sometimes show itself when and where least expected. Sometimes the best results will be obtained by merely sowing seeds of any good variety, trusting to its inherent good qualities being transmitted to the offspring.

From the Austin I have got seedlings all of which resembled the parent, but were inferior; and I have noticed that all of this class, such as the Downer, Iowa, Chorlton, Georgia Mammoth, etc., are very likely to produce varieties no better than the wild Western berry from which they evidently all originated. It is very easy to get a large variety from this class, but seldom a good one. From the Bicton Pine I have grown large, sweet, orange-colored fruit, but, like the parent, unproductive.

From the Oscar, which is a poor grower, I have produced fine growers, and those that were moderately prolific; but the fruit was sweet and dry.

The results of some of my experiments are exceedingly curious, such as producing five distinct varieties from the Bartlett, all of which had entire leaves, not lobed. They were similar to those described by Duchesne as raised by him

at Versailles in 1761, and called the Monophylla, it being just 100 years (so far as I have been able to learn) since the first one-leaved strawberry was grown until the second was fruited by me in 1861. But neither was of any value, except as a botanical curiosity.

From the Iowa I produced a five-leaved variety, and one with leaves having a beautiful silver stripe, but of no value to the cultivator.

How to raise Seedlings.—When the berries from which we wish to grow seedlings are ripe, they should be mashed and mixed with dry sand, so thoroughly that no two seeds shall remain together, putting sufficient sand to absorb all the moisture. Then sow the sand containing the seeds in a bed previously prepared in some half shady place, or under glass, sift on some fine mold, covering the seeds about an eighth of an inch deep. If the soil is kept moist, the plants will begin to appear in about four weeks, and will continue to come up until cold weather; at which time they should be covered lightly with straw, say one inch deep. The plants should be set the following spring, 18 inches apart, in rows, at least two feet apart.

Stop all runners every week throughout the season, and keep the beds clean. The second year after transplanting, you will have fruit. Mark sexes of each as they come into blossom. As the fruit ripens, mark the time and character, and select the very best and destroy all other plants. Lift carefully those that are to be preserved, and put them into new beds where they will have more room to make runners. The correct estimate of the value of any new variety can not be ascertained until it has fruited two or three years. For my own part, I shall never save a pistillate, although I have done so heretofore extensively, for the purpose of ascertaining by actual experiment whether they were any more likely to be better, or more productive than the bisexual varieties.

The results of some of the largest experiments which I have tried are, that out of several hundred seedlings of 1856 none were good, although sown from the best seed that I could obtain. In 1859 I raised another large quantity. Being more careful in selecting the varieties and in their fertilization, the result was a thousand different varieties. There were sixty pistillates, one staminate, which produced no fruit, and the remainder bisexual or hermaphrodite.

Out of this number, I have three varieties that have fruited three years, that I think worthy of being cultivated. From two hundred seedlings of 1860, fruited two years, I shall keep two for further trial.

To those who may think this a tedious undertaking, I would say that no one should undertake to produce new and improved varieties of fruits and flowers if it is to be looked upon as labor. It should be made a pleasant pastime.

[The above was read at the last meeting of the Farmer's Club of the American Institute, and is sufficiently interesting to find a place here.—Ed.]

EDITOR'S TABLE.

To Contributors and others.

Communications, Letters, Catalogues, Periodicals, Remittances, Packages by Express, Advertisements, &c., should be directed to MEAD & WOODWARD, Editors and Proprietors, 37 Park Row, New York. Exchanges should be addressed to "THE HORTICULTURIST."

HYBRID PERPETUAL ROSE, EVEQUE DE NIMES.—(*See Frontispiece.*)—We present this month for a frontispiece an engraving of the Rose Eveque de Nimes, a comparatively recent acquisition. It is a Hybrid Perpetual, hardy, and promises to take its place among the best. Our description of the plate was overlooked till the form was made up, and we merely allude to it here.

CHERRIES.—We are indebted to Mr. Caywood. of Modena, N. Y., for a box of Great Bigarreau and Bigarreau of Mezel Cherries. They were large and fine. The Great Bigarreau is one of our best Cherries.

THE CLARKE RASPBERRY.—Last spring we received a seedling Raspberry from Mr. Clarke, of New Haven. It has fruited, and afforded us much satisfaction. It is a stout grower, and has borne abundantly. The berry is large, red, sweet, and high flavored. It is a decidedly good thing. We should not be sorry to have a large bed of it. Mr. Clarke's plan of sending a plant instead of simply the fruit, is a good one, as it enables us to speak more confidently than we otherwise could. We received at the same time a new Rhubarb, which looks finely, but we have not yet cut it.

THE ASPARAGUS BEETLE.—We have received additional items in regard to this beetle, but we think there must be others of our readers who have seen it. We desire all the information we can get.

MILLER'S HORTICULTURAL AGENCY.—We gladly call attention to Mr. Miller's new Horticultural Agency, announced in our advertising columns. The object is to afford facilities heretofore wanted for the sale and purchase of plants, trees, fruits, books, wire work, and all other objects pertaining to Horticulture. Such an agency will prove equally beneficial to buyer and seller. The design is to keep on hand specimens of all the objects above named, which will afford the public an opportunity of making selections without the labor of canvassing half the city to find articles which no one person keeps on hand. Mr. Miller is a

prompt business man, and is deserving of the patronage which we hope he may receive.

METCALF'S KEY TO BEE-KEEPING.—The title of this book, which has just been laid on our table, reads as follows: A Key to successful Bee-keeping: being a Treatise on the most profitable Method of Managing Bees, including the Author's new System of Swarming, whereby all watching for Swarms during the Swarming Season is done away with, and all loss by flight to the woods prevented. By Martin S. Metcalf. Published by C. M. Saxton, 25 Park Row, New York. Price 35 cents.——There is a promise of something fresh in this little book, but we have had time only for a mere glance.

TO MAKE CURRANT WINE.—We have lately had many inquiries in regard to making currant wine. "One who has tried it" sends us the following, which we insert here, not being able to get it in its proper place. The receipt is a very good one, and if followed out will insure a good article of its kind, as we know from having tasted it. Our own method differs but little from it. If a sweet wine is desired, a little more sugar must be added, and the process of fermentation stopped before it is completed; but this we do not advise. In regard to adding spirits, the sugar will furnish enough of that; none should be added.

First.—The currants should be fully ripe.

Second.—Have every thing prepared beforehand—all the currants picked and ready, as when one commences the process of making the wine he has no time to look about for materials of any kind. The work must be done speedily, and with cleanliness.

Third.—Have ready a small press, a tub, a pounder, a pan to receive the juice, a measure, a dipper, a funnel, and the vessel to receive and ferment the wine.

Fourth.—To make five gallons of wine, use twenty pounds currants, and nine pounds double refined loaf sugar, to be dissolved in some of the wine over the fire in a preserve kettle. To make a barrel of wine requires about 165 pounds currants. Sixteen pounds yield one gallon of juice in a press: two and a quarter pounds sugar to each gallon of wine, which consists of currant-juice and water, as hereinafter described. This does not make a sweet or sirupy wine. If sweet wine is desired, it may be made at any time after the wine is fermented, by adding sugar to suit the taste. If more sugar is added than stated above, and well fermented, it adds strength and not sweetness to the wine. If the wine is not well fermented, it remains sweet, and is a sirup not wine.

Fifth.—Take twenty pounds currants; mash them well in the tub with a pounder; have ready a bag of light bagging; with a dipper put the pomace in the bag; lay this in the receiver, (mine is made of a half bushel measure fitted with a follower, with a wooden screw, such as is used on a carpenter's bench, but placed perpendicularly). The bag need not be tied, only doubled over in the receiver;

then press gently at first, afterwards more severely; when the juice is all pressed out, strain and measure it. I find it yields five quarts. Then take the pomace from the bag; place it in the tub, and pour on to it five quarts pure rain water, (hard water will not do;) pound it well, mixing with the water, and breaking such currants as did not get cracked before; then press as before. The yield will be something over five quarts. Take the same pomace from the bag; place it again in the tub; add five quarts pure rain water, (the rule is to add as much water each time as there was currant-juice obtained from the first pressing;) pound this well, and press; placing the wine each time in the fermenting vessel. Having obtained all the liquid, let the vessels used be soaked in water, preparatory to cleaning. Take some of the wine to dissolve the sugar, which should be in the proportion of two and a quarter pounds to each gallon of liquid thus obtained. For twenty pounds currants the sugar required is nine pounds. When the sugar is dissolved, mix all together, and let it ferment in a moderately cool place. It is better that the fermentation should be slow; at first it will be rapid. The vessel should be full, and must not be closed tight, especially if it is a glass vessel. The carbonic acid gas evolved will break any vessel if tighty closed. A small aperture may be left for its escape. I prefer the tube bung, letting the gas escape into a cup of water. I let it ferment about six weeks.

Sixth.—Sugar added to the wine increases its bulk or measure in the proportion of 12 lbs. to one gallon. In making a barrel of wine it is better to have a larger amount of currants on hand than a less quantity.

Seventh.—Alcohol barrels are often used for this purpose, but are not suitable. Alcohol barrels are prepared inside with glue, which is not dissolved by it, but wine will dissolve this glue, and becomes impregnated with its flavor. The best casks are those that have been used as wine barrels, with iron hoops, and may be bought for one dollar each. Wooden hoops in a cellar, after a year or so, burst off and cause leakage.

Eighth.—The wine, after fermentation, should be bunged up tightly and left to stand in a cool, dry place until it is clear, when it may be bottled if intended to be used within two years. When first made, and for two years, it is a bright ruby color. In three years this color is precipitated gradually, and the wine assumes a color resembling brown sherry. If kept in bottles until this deposit takes place, it is liable to be again mixed with the wine when the cork is drawn, and this makes it muddy. The Scriptural injunction, "Look not upon the wine when it is red," is especially applicable to currant wine. This wine carefully made will keep without the addition of spirits, and is worthy of any prince's banquet after it is old enough to precipitate its red color, and continues good, if well kept, for the next six years. Mr. Downing says, "Currant wine is very popular among farmers, but which we hope to see displaced by that afforded by — grapes." I advise to try this while we are cultivating the grapes, and then give us good grape wine too.

Correspondence.

Ed. Horticulturist:—I send by express two varieties of Cherries, Conestoga and Late Amber, the latter a seedling brought to notice by Jacob Cocklin, of York County, Pa., (Shepherdstown P. O., Cumberland County, Pa.;) the former by Caspar Hiller, of Conestoga Centre, Lancaster County, Pa. I have never seen either noticed in the Horticulturist, and deeming them valuable for their lateness, and other good qualities, take the liberty of sending you specimens. Remember the Black Tartarian, Mezel, etc., were gone a week ago.

The Amber is a beautiful pyramidal tree, very productive, and will bear its fruit until nearly dry without rotting, if left on the tree.

The Conestoga is a rampant grower and profuse bearer. Of their quality and appearance I hope you may have a fair chance of judging.

I have about thirty varieties in bearing. The Triumph of Cumberland was this year the largest, most beautiful, and of the first quality. It and the two above varieties blossomed some ten days later than most varieties, and are with me the surest bearers. I have no interest in praising these varieties, for I have no trees to sell, but wish all lovers of cherries to have it in their collection.

Also a Raspberry, the Surprise, found wild in Missouri by some western horticulturist, and was sent me by George Husman, the horticultural pioneer of the far West. It is perfectly hardy, a strong grower, and good bearer. There may be but a few berries ripe upon it, but you can judge of its quality.

I will also send you a few of a red kind that we have known here for thirty years, and which is much esteemed with us. Can you tell me the true name of it? it is called Purple Cane, English Purple, Red Cap, and some other names. It is an American variety, propagating from the points drooping to the ground. None excel it in strong cane and profuse bearing. This red one, Doolittle, (a superb fruit,) and the Surprise will occupy most of my grounds that will be planted in Raspberries hereafter. Of course, Red Antwerp, Brinckle's Orange, etc., some twenty varieties, have a place; but the foreign sorts are too much trouble, where we only get from ten to fifteen cents per quart.

Of Strawberries I might also write, but to my notion it would only include three names for general cultivation: Albany, Hovey, and Triomphe de Gand, the latter holding the front rank. Fruit now near me in alcohol of the Triomphe that measures five inches in circumference. My crop of Strawberries run in the neighborhood of a hundred bushels. Not bad for a little place, is it?

S. Miller.

Calmsdale, near Lebanon (P. O.,) July 7th, 1862.

[The Cherries and Raspberries came to hand in good condition, for which we

thank you. The Late Amber is a medium sized cherry of firm flesh and delicious quality. We know of no late Cherry so good. Next fall it goes in our grounds if a tree can be bought. Can you send us a "portrait" for a frontispiece? We were so absorbed in tasting, that we forgot it till they were all gone. The Conestoga seems to be a great bearer, of good size, juicy, and of very good quality, but by no means equal to the Late Amber. It is valuable, however, for its lateness and good quality. The Surprise Raspberry belongs to the Black Cap family. The berry is large of its kind, and very sweet. The red berry is known by a variety of names; but we think, for several reasons, that it would be best to retain the name of Red Cap. It is a high flavored fruit, and one of the best for general cultivation, especially among farmers.—Ed.]

Editors Horticulturist:—*Gentlemen*,—We have at times delighted in unweaving the mysterious web and woof of vegetable life. The cultivation and care of plants and trees always brings pleasure; and we confess a peculiar fascination in watching those pips or seedlings, planted by our own hand, as daily they gather new strength, and so reach the maturity of bloom or the ripeness of the harvest. They are our *other* children. What if better plants could be had from a florist? they would be only as adopted favorites; the *other*, as it were, of the same flesh and fibre, cherished tenderly. Yet they will not be always mindful of our wishes. Slips procured with difficulty repel our delicate attentions, become obstinate, and refuse every semblance to radication. Won't you tell us how better to propagate our choice Evergreens? We have attempted many times some of the new Junipers, and Arbor Vitæ, and Rhododendrons; and with green-house, and bell-glasses, and constant care, thought to succeed; but quite too often to be agreeable to us, have failed. Won't you tell us also when and how to shear our Evergreens? Would you cut back the leaders and side branches of your Spruces? And would that treatment of the Pines, especially, be well, when too open or not of regular contour? The Hemlock and the common white and red Cedars bear the shears well; but the tendons of our arm strangely relax when we reach toward the drooping Juniper, (J. ob. pendula,) or the drooping Arbor Vitæ, (T. filiformis,) or even the Biota aurea. Would you leave these untouched, and so not pleasing to your eye, or by cutting suit them to your purpose? One thing more, and I will have done. Why is it, in the name of consistency, that nurserymen persist in calling all drooping trees and plants "weeping?" We think the several varieties of drooping Willow the perfection of beauty and grace, and far removed from the sombre associations of a hearse. The beautiful Kilmarnock is not "weeping." Watch it in a light breeze: call it laughing rather, and we bestow our hand, and with it our approval. Yours truly, ——

[We share with you all the delight you have felt in "unweaving the mysterious web and woof of vegetable life." The pleasure is as deep as the mystery which

surrounds it; but the devoted and loving student sometimes gets a glimpse of the inner life not vouchsafed to him whose soul is not pervaded with a deep and pure love of nature. Such a glimpse, we think, you have more than once enjoyed, and long for a deeper insight into the mysteries of nature's inner life. We will help you to the best of our knowledge. We can conceive of many reasons why you have failed to propagate your evergreens, even with the assistance of your greenhouse and bell-glasses. The details would require a long article. A house for propagating evergreens should have a northern exposure, bottom heat, and a low temperature in the house. With these conditions, and a bed of charcoal and sand, you will have all reasonable success. In the spring you can obtain these conditions out-of-doors by using a frame facing north, and ventilating judiciously. Some evergreens are better raised from seed than cuttings; for instance, the Pines. The Arbor Vitæ is easily raised from cuttings; the Juniper can be readily propagated by twisting and layering a branch in the open air; Rhododendrons you must graft. We think these hints will put you in the right way. Evergreens seldom or never need the shears, except when grown as hedges. When a hedge is once formed, one clipping or shearing is generally sufficient, and this should be done in spring just before growth begins. If another shearing is necessary, it should be done just before the second growth. Shears are made for the purpose. A sickle or grass knife is sometimes used, but never makes neat work except in very skillful hands. Stretch a line at the top at least, so as to preserve the uniformity of the hedge, unless you have a very nice eye. Preserve, as much as possible, the natural outline of the tree of which the hedge is formed. We would not cut back either Spruces or Pines, except they were wanting in natural form and fullness; and then only enough to bring them into proper shape. If the Juniper, etc., were not of the proper shape we should cut them, but not otherwise. The term "weeping," as applied to trees, is undoubtedly a misnomer, and one that we could wish to see abolished. Trees do not weep.—Ed.]

What's in a Name? A Rose by any other name would smell as sweet. —*Mr. Editor*,—Were it not that I know you personally to be a man of good sense and gumption, I should class you among the green ones. Could not you see from the "hand write" that my article, published in the May number, page 222, signed Pratiquer, was written in a female hand, and that the hits on female names were consequently legitimate? why need you, in another article, page 223, say, "Ugly Pratiquer?" Ugly, indeed! You must know I have as handsome a miniature of him as you or any body else ever saw. But my present object is to let you know how you were taken in. Pratiquer, being engaged in his vineyard, desired me to furnish an article for him for the May number, and I thought it a good opportunity to give the female names a sly poke under the ribs. You men are so weak on that point that you prefer to give a poor name, if female, thinking it flatters our vanity. Now, I am willing to compromise with you: call flowers

by female names, for they are changeable, evanescent, *and many soon go out of fashion;* but fruits should have something substantial in the name. I do not fancy your suggestion to give *male* names, but I think it preferable to ladies' names, which change in every generation at least. But enough of this. I wish you would treat us ladies, as you are pleased to call us, as if we knew something, and were at least as nearly equal to men, as the rebels are said by themselves to be to the Yankees—one to five—I think you would find your account in it.

How about that joke of the Tropœolum which you played on one of your lady friends? Will you tell me, or shall I apply to Mr. Buchanan? Yours really,

FRANCES MARY.

[Well, Frances Mary, we suppose we shall have to accept your explanation, and admit that we have been "taken in" by a woman; but how could you have "gone and did it?" See how you have rewarded our innocent and unsuspecting nature. Many men would go into antics, and never trust a woman again; but *we* shan't do that. We shall go right on trusting in women, and think them all angels. We said "Ugly Pratiquer," but only playfully. Isn't that plain? Now, Frances Mary, what do you mean by calling the women "changeable," and "evanescent," and "going out of fashion?" You know they ain't, and they don't! We can't compromise on that basis; it wouldn't do, for we should lose more than half our friends. We'll do it on a more reasonable one, though. Don't we treat the women as though they knew something? That's odd enough. If you had made the opposite point, you would have been much nearer the head of that nail. Why one good woman is equal to any five men, and better than all the rebels in Secessia.—The joke about the Tropœolum consists in this, that we left a new and rare green-house plant in charge of a female friend, and she ate it up for a common 'sturtium! Wasn't that good?—ED.]

DEAR SIR,—As it may be interesting to some of your readers to know how to preserve the flower of the Night-blooming Cereus, I will give you my experience in preserving it. On the 27th of June, 1861, I saw that I was going to have a flower that night. Having seen it stated that the flower could be preserved in spirits of wine, I procured a large glass jar filled with spirits, and when the flower was fully open, about ten P. M., I cut it off from the plant, and put it in the jar, so that it was all covered with the spirit. It is still in a perfect state of preservation. I preserved one on the 25th of May last, which looks well. As the flower opens and is gone in a few hours, it is not the privilege of a great many to see it on the plant. Yours truly, GEORGE CRUIKSHANKS.

Whitinsville, Mass., July 8, 1862.

[The above is a very good method of preserving the Night-blooming Cereus, as well as many other flowers, and may be new and interesting to many of our readers. If it be wished to send the flower to a friend, cut it off during the day, and

put it in a box with sufficient room to expand. It must be cut, of course, on the day of the night that it would naturally open, to have it in perfection. We have had them open in our hand while carrying them to a friend.—Ed.]

A few "Bedding Plants."—Our correspondent, "Fox Meadow," who is always looking about with his eyes open, sends us the following useful hints about Bedding Plants:

Mr. Editor,—Roving through our horticultural beauties in the vegetable world, allow me to inquire, "Do you know Pretty Polly?" Suppose you do lots of them! But let me tell you what Pelargonium Pretty Polly is. This Pelargonium is of the sweet-scented order; produces a good truss of flowers, bright rose, white throat, with black spot on the upper petals; stands the hot weather well; grows profusely and flowers admirably all the summer in the open border; is one of the good bedding-out plants. A row or clump of it makes a dashing show.

Quercifolium Superbum. Another very sweet-scented geranium, with a bright scarlet truss, the upper petals having a dark spot. A great improvement on the old varieties in its class.

Lobelia Erinus Compacta. Every body who loves flowers ought to grow it. A most lovely blue, of very dwarf habit, and perpetually in flower. Is well adapted for an outside border plant, verging the walk. Is always to be seen, yet unassuming. Grows admirably in pots, and flowers during winter.

Lobelia Aurea, is sister to the above; habit nearly the same, but having flowers of a beautiful golden yellow. Grown in lines or rows, these two Lobelias form a pleasing sight and a beautiful blending of color.

Gazania Splendens, with me stands the hot sun well, and grows well; over fifty flowers on one plant. Every body who sees it asks, "What is that?" It is not *Rigens* we used to know when a boy in "Fader Land." Strikes freely from cuttings in the fall and spring.

Wellington Hero, is a bright scarlet geranium, with a very striking white eye. The truss is good; petals well rounded, with good substance; free bloomer, and is what may be termed a good scarlet.

Heliotrope, Beauty of the Boudoir, is one of the most fragrant of its class; is one of the "purples," having very large trusses of flowers, and no person will be deceived in his expectations of a good Heliotrope who grows it. We have seen a good stock of the above growing at Mr. John Wood's florist grounds, Fort Washington, who, I am proud to say, is quite a connoissuer in the good little varieties that tickle the weak points of Flora.

We are enabled to endorse all that Fox Meadow says of the above plants, though we think Gazania splendens has been overrated by some as a bedding

plant for our climate. Add *speciosa* to the Lobelias, and we have as perfect edging plants as could be desired in their way. Scarlet Geranium Wellington Hero is one of the very best Scarlets that we have yet seen. Oh! we forgot to say that we *do* know "lots" of Pretty Pollies, and they talk, too, and say all kinds of pretty things.

BROOKLYN HORTICULTURAL SOCIETY—CONVERSATIONAL MEETING.

The Society met at the Academy of Music, on Tuesday evening, June 24th, President Degrauw in the chair. On the table were paintings of flowers by Mrs. Stirrup; Antirrhinums, Petunias, a very fine seedling Rose, etc., from Mr. Burgess; and cases of insects from Mr. Weibe.

A letter was read from Messrs. Graef and Weibe, proposing a plan for the destruction of the measure worm in the city, which they wished the Society to examine and recommend. They proposed to rid the city of worms by the year 1864. They wished to know how far the Society would aid them in the matter in case of success, claiming no compensation until a committee should report favorably.

After much discussion by Messrs. Eastman, Jones, Spooner, Barnard, Fuller, Burgess, and others, it was moved by Judge Greenwood, that a committee be appointed, to report at next meeting. Dr. Jones, Judge Greenwood, L. B. Wyman, Rev. Dr. Storrs, H. A. Spooner, Professor Eaton, S. J. Eastman, Dr. Trimble, and Judge Murphy, were appointed said committee.

Dr. Jones stated that the worms were already in our gardens on all kinds of trees, plants, and shrubs. As far as he had investigated the matter, they were first seen about twenty-four years ago, even on the Ailantus.

Dr. Thorne had tried every thing to rid his trees of the pest, but had been unsuccessful.

Mr. S. J. Eastman, said he had found more benefit from placing small wren houses in the trees and about his grounds than from any thing else he had done, and he had no doubt if the city would do it generally, it would be productive of much good, and then have strict laws for the punishment of any one injuring or frightening away the birds from the streets and trees of the city.

Mr. S. B. Brophy read a communication from Mr. L. Brandeis, on the Anacharis alsinostrum, a fresh water plant of wonderful powers of increase, not known among botanists to have flower bearing plants. Mr. Brandeis has had it flower in his aquarium, and regards the discovery as an item of great interest in botany.

A. S. Fuller stated that the Rose of Mr. Burgess was only a sample of what might be accomplished by raising seedlings. No one could plant seedlings but what they would get something good, and they might get a very superior one which would be worth thousands of dollars.

Mr. S. B. Brophy hoped the practical gardeners present, when speaking of roses

or any kind of flowers, would give the members the qualifications of a perfect plant, fruit, or flower, and what was necessary to constitute it a perfect one of its kind. In England, Glenny's standard was adopted, and unless they were up to that, they were not allowed at exhibition. This is much wanted here, and it is to be hoped this Society will take the lead in this much-needed reform. It costs no more in time or expense to grow a good plant or flower, than a bad one, and the result will be much more satisfactory.

After some further discussion, the Society adjourned.

The Society met again July 8th, the President in the chair. Mrs. Humphries presented Bouquets and Baskets of Flowers; Mr. Miller presented native plants, such as wild Rhododendrons, Orchids, Cranberries, etc.; Dr. Benedict a flower of the Hæmanthus Bakerii; Mrs. Duychinck a beautiful double-white Hollyhock; Mr. Burgess new dwarf Digitalis, seedling Roses, seedling Dahlias, Daphne cneorum, etc.

The President said that at the last meeting a committee was appointed upon the subject of the measure worm. He understood that the committee were prepared to report, and the Society would now be happy to hear the result of their investigations.

Dr. Jones, the Chairman of the Committee, then submitted the following report:

Mr. President—The Committee appointed at the last conversational meeting of this Society "to examine proposed plans for the extermination of the measure worms, and to bring the whole subject in relation thereto, in an intelligent form before the Society," respectfully report that they have given the subject referred to them as much consideration as the time allowed, permitted. The description given by the late lamented Thaddeus W. Harris, of the worms which infest our shade trees, is in the main correct. They belong to the order of Lepidopterous insects, to the great division of the Phælana called Geometra, and to the species Geometra micosericearia.

The Committee have examined several plans submitted to them for the extermination of this pest, particularly the one submitted by Messrs. Graef and Weibe, a copy of which is herewith presented to the Society, and we respectfully recommend the adoption of the following resolution:

Resolved, That while, in the opinion of this Society, the plan proposed by Messrs. Graef and Weibe for the extermination of the worms which infest our shade trees is not entirely new, yet that, if faithfully carried out, it will so materially reduce their numbers that in a few years they will scarcely constitute a nuisance, and it may possibly be effectual ultimately in accomplishing their extermination.

They beg also to state that many of this order of insects are now being preyed upon by internal parasites, several kinds of which have been obtained

from the crysalids. One of these is a small ichneumon fly, described by Mr. Say in the first volume of the *Boston Journal of Natural History*, under the name of the Cryptus conquisitor; the other a smaller and much rarer insect, also described by the same gentleman, under the name of the Chalcis ovata. Your Committee congratulates the Society upon the appearance of several of the species of this order, the hunter-fly or wasp, in this city; they have, several of them, observed the havoc among the gronutra, in its caterpillar and pupa states, and they have great faith in the power and ability of this order of insects to materially lessen, if not destroy the great mass of the lepidoptera. Your Committee believe, that the effort toward the extermination of the measure-worm can be materially aided and the work expedited by encouraging and protecting our native birds, the martin, swallow, wren, etc. The former can be accomplished by placing small houses in the trees for their use. The city authorities and our private citizens should at once, conjointly, carry this suggestion into effect. The cost would be small, the advantages great. At the same time the Common Council should pass an ordinance making it a severe penalty to molest or destroy either the birds or the bird-houses, and cause such an ordinance to be promptly and effectually carried into effect. In connection therewith, your Committee would recommend the adoption of the following resolution:

Resolved, That the President of this Society petition the Common Council, in the name of the Society, to place in the trees growing upon lands belonging to the city, such small boxes or houses for the object herein set forth, and to pass an ordinance for the effectual protection of birds and their habitations.

They further believe that the city can be more speedily cleared of these worms by some well-digested plan, which aims at the methodical destruction of this insect in all its stages, faithfully, perseveringly, and extensively carried into effect, and such a one has happily been presented by Messrs. Graef and Weibe.

They would therefore recommend that a committee of one from each Ward in the city be appointed by the chair, to ascertain the condition of the infested trees in their respective Wards at the present time; that this Committee report in writing to this Society the result of such examination; that said Committee be continued, with power to fill any vacancy that may occur, until such time that they may be discharged by the Society; that they each year successively examine said trees at or about the corresponding month of their first examination, and report annually to this Society the result of their examinations and their opinions thereon. Also, that the Society offer a premium of $—— to be awarded to any person or association of persons whose plan or plans may prove the most speedy and efficacious in permanently exterminating from the city, the worms which now infest our shade trees, and at the same time by its operation prove the least injurious to such trees.

They would further suggest the propriety of raising the amount of said premium from the members of the Society by private subscription.

Your Committee firmly believe that parties owning property and having infested trees thereon will freely and willingly remunerate any one who rids them of this pest, and the Common Council will deal liberally with those who confer so great a boon upon our beautiful city.

Finally, they are of opinion that this Society, in thus offering a premium, keeps within the limits of its powers, and by appointing a number of its members as co-laborers in the work of destroying and freeing our city of this objectionable worm, is discharging its duty to the community, and all obligations, financial and otherwise, imposed upon it by this question. Respectfully submitted,

J. B. JONES, M. D., Chairman, D. G. EATON, J. GREENWOOD,
A. J. SPOONER, L. B. WYMAN, SMITH J. EASTMAN.

Dr. Trimble, being called upon for some remarks, said that so far he had not examined the matter so as to be enabled to report that evening. His investigation had not been concluded, and had been directed chiefly to the parasite insect spoken of by the chairman of the Committee. But his investigation, he would say, promised satisfactory results. Lately he took some thirty pupæ of the measure-worm, and in fifteen of them he found the larvæ of this parasite. These were procured in New York; those he had procured in this city he had not as yet had an opportunity of examining. If the Society chose to continue the subject, no doubt he would be able to report definitively in a few weeks. As to the martins and swallows, he thought they would be a disadvantage to them in getting rid of the worms. What they would have to depend on to get rid of the worms, were flies, and those birds were essentially fly catchers. The wren and the small warblers would be useful, but the best sort of bird for the purpose was the Baltimore Oriole. Birds such as the robin and thrush would be useful, but we could not induce them to frequent the city. As to the Oriole, they could not get them to come here because the trees were not high enough, their habit being to build in lofty trees. Whether this pest—the measure-worm—could be extirpated by artificial means, it was for the Society to determine. It was but a very limited power that man had over these insects, so rapid was their multiplication. He thought they must depend most on the parasites to destroy them. How far the ichneumon parasite would help them it was difficult to decide; time alone could tell that.

Mr. A. Spooner moved that Dr. Trimble be requested to continue his investigations and report at his earliest convenience.

Mr. Burgess bore testimony to the fact that the wasp is a destroyer of these caterpillars.

Mr. S. J. Eastman agreed generally with the report. He considered the proposition of the gentlemen upon whose application to the Society the report was predicated, to be a thoroughly practical one. They described the habits of the worms, and the only practical mode of destroying them. Indeed, he

thought it the only plan they could depend on with any prospect of success. It was one attended with much labor by the gentlemen who undertook the task, but they asked for no remuneration until the work was completed to the satisfaction of the Society. Therefore, he considered that the Society should not hesitate in accepting their proposition, for he was confident that they would be successful. He did not believe in waiting until these ichneumon insects accomplished the work; well and good if they aided these gentlemen in the feasible plan proposed. He had the utmost confidence in birds, as suggested. Last year he put up a number of bird-houses in his grounds; this year he doubled the number, and next year he would treble them. The result had been most satisfactory in his and adjoining gardens.

Some discussion then ensued as to whether it were competent for the meeting to entertain the report, it not being a business meeting. Finally, the report was laid over till next Tuesday evening, and the special committee were requested to continue, and assist at said meeting.

Fruit Growers' Society of Western New York.—The Fruit Growers' Society met at the Court House in Rochester on Tuesday, the 25th of June, the President, H. T. Brooks, in the Chair. We copy the proceedings from the report in the *Country Gentleman*.

PRUNING DWARF AND STANDARD PEAR TREES.

The following question was discussed: What is the best form of pruning the Dwarf Pear Tree? and what the best for the Standard, and the best season for doing it?

W. P. Townsend, of Lockport, said he was decidedly in favor of the pyramidal form, cutting pretty severely, and leaving the lower branches the longest. Pruned after the severe frosts was past. If pruned too early, the frost injured the top buds. Care should be taken to cut to the bud, which would make the top even. The habit of the pear tree is vigorous, and bears close pruning. Would cut off the limbs from the body about one foot high before letting the tops come out. Would have the limbs come out about 18 inches or 2 feet. If the tree is vigorous, would not cut so short as if the tree was not.

G. Ellwanger did not prune sorts of vigorous growth as severely as those of more moderate growth.

C. Downing, of Newburgh, said the upright kinds should branch lower than those that grow more horizontally.

E. Moody, of Lockport, thought dwarf pears should be pruned *inside* as well as *outside*—they should be thinned out on the inside. The plan of shearing like a cedar, the outside of the tree, will in a little time spoil the tree.

C. Hooker said he had found the same difficulty in pruning—the inside of the tree was growing too thick, and he found it necessary to thin the inside.

H. N. Langworthy thought it was evident that the pear cultivators were on the

extreme in pruning so close. He thought it necessary to give the tree a little more room—not to prune so close—would cut the inside out of standard pears—would take out the leader. The trees are disposed to make a leader, but by cutting it out, it makes the tree wider and better shaped.

Mr. Lee, of Newark, cut back in August in order to get fruit spurs, and so fruit the next year.

PINCHING PEAR TREES.

G. Ellwanger.—The first advantage of pinching is in checking the growth, and thus assisting the formation of fruit spurs. It also assists the job of pruning in winter. Generally performs the pinching in June, when the young shoots are about 6 inches long. He only pinches those shoots which are intended to bear fruit the next year. He never pinches the leading shoots. The object of pinching is to make fruit buds, and also to thin out the inside of the tree.

USE OF ASHES, LIME, AND CHARCOAL IN ORCHARDS.

The President thought charcoal a very valuable material to use as an absorbent of manure. His apple trees, planted on charcoal beds, are very much improved indeed, and were probably twice as large as the others in the neighborhood.

Mr. Harris, of Rochester, asked if there was not considerable ashes in the soil, and was answered in the affirmative.

Dr. Beadle had used pure charcoal as a manure, and could not see that it produced any effect. Thought its principal benefit was owing to the burnt earth, which was always found in old charcoal beds, and which was found in England to be very valuable for fruit trees.

Dr. Sylvester, of Lyons, had found considerable benefit from it. Thought muck a material very similar to charcoal, producing very similar effects.

FIRE BLIGHT ON PEAR TREES.

The President had thought that the blight of pear trees might be owing to the use of animal manure.

L. B. Langworthy was perfectly dumb-founded as to the cause of the fire blight in the pear. Thought the use of animal manure was perhaps the cause. He thought it was an overstock of sap, which could not be elaborated by the leaves—it was in fact *plethora*. Charcoal he considered to be of very little or no value; but ashes he considered to be extremely valuable—never saw any situation in the world in which it was not valuable—good for every thing.

B. Fish had in one instance a tree which showed considerable inclination to crack, but upon putting on a large application of soap suds and ashes it recovered from the disease, and has not cracked until this year.

S. W. Holmes, of Syracuse.—A German gardener in his city raised a very excessive quantity of fruit in his own garden by the free use of ashes in the ground. He also had noticed in his own grounds a very decided benefit in regard to the quality and early maturity of the fruit, and caused probably by the ashes.

APPLICATION OF MANURE.

Question.—The application of manure to the surface. At what season is the application most beneficial, and in what condition should the manure be when applied?

E. Moody, Lockport, has always been opposed to surface manuring, as being too wasteful. If it was to be used at all, he would use it in the spring early. It would leach some, and would then serve as a mulch to the plant.

E. W. Sylvester, of Lyons, thought it not best to apply fresh manure to the surface, as it would lose all its ammonia, but would recommend composting by putting muck and manure in alternate layers until the pile is 5 or 6 feet high. This remains until fall, and then is fit for use. It is found to be well rotted, and fit for any use. This compost he used as a surface mulching, forking or dragging it in in the spring.

C. Downing would recommend putting compost manure on the trees in the fall, and fork it up in the spring.

H. N. Langworthy has been using liquid manure made from night soil, and found remarkable effects from it—greater effects, in fact, than he had ever seen before from any other manure. Old bearing pear trees had made a growth of 5 feet in some instances, and in all had grown remarkably.

THE CURRANT WORM.

Question.—The Currant Worm. What are its habits? What are the most effectual means for its destruction?

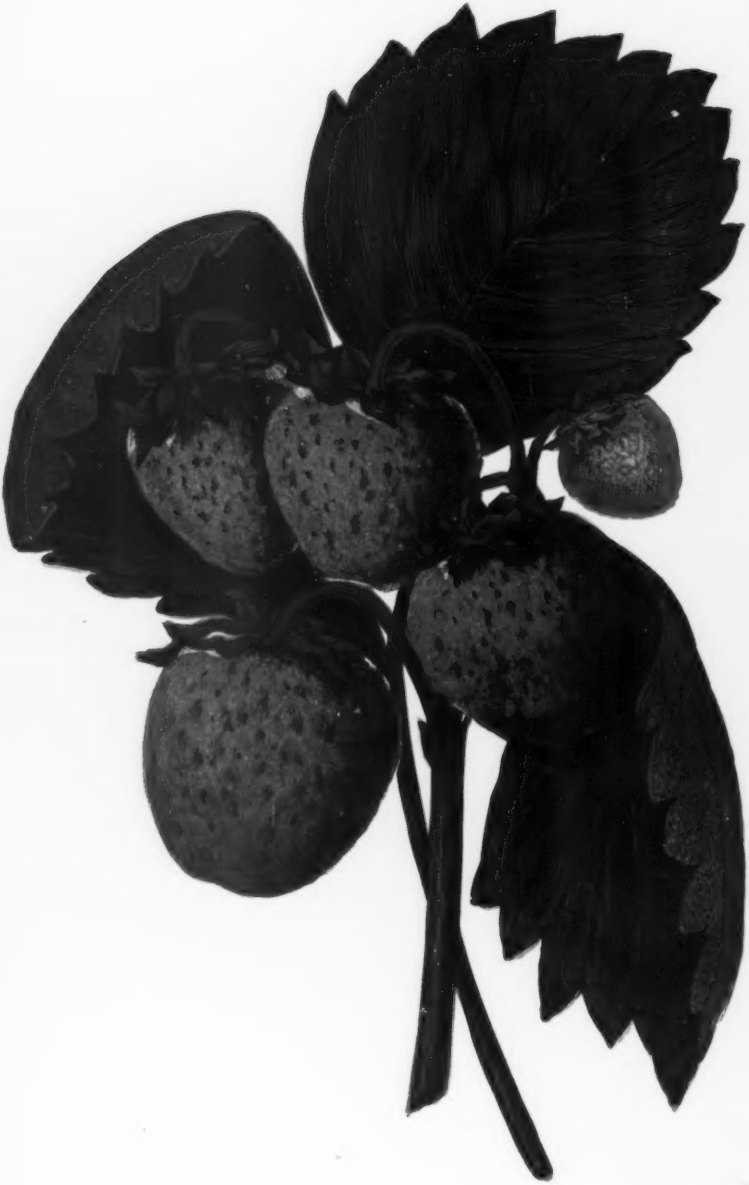
Geo. Ellwanger.—During the past month we have used slack lime every day or every other day, and have succeeded perfectly, destroying all of them—covering the leaves and fruit with the finest dust. It does no harm to the foliage or fruit. He considers it a complete remedy.

H. N. Langworthy has used a solution of soft soap and water, *very strong*—had had perfect success—killed the worms without fail—must be put on often.

Dr. Beadle had found the use of air slacked lime a perfect success in killing the worms.

Dr. Sylvester had used one pound of whale oil and four gallons of soap water, and succeeded entirely in saving the fruit and killing the worms—had pursued the same course this year, so far with perfect success. He applied it every other day.

(*To be continued.*)



THE MONITOR STRAWBERRY.

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